2022 Index IEEE Transactions on Semiconductor Manufacturing Vol. 35

his index covers all technical items—papers, correspondence, reviews, etc.—that appeared in this periodical during 2022, and items from previous years that were commented upon or corrected in 2022. Departments and other items may also be covered if they have been judged to have archival value.

The Author Index contains the primary entry for each item, listed under the first author's name. The primary entry includes the coauthors' names, the title of the paper or other item, and its location, specified by the publication abbreviation, year, month, and inclusive pagination. The Subject Index contains entries describing the item under all appropriate subject headings, plus the first author's name, the publication abbreviation, month, and year, and inclusive pages. Note that the item title is found only under the primary entry in the Author Index.

Author Index

A

Abu Ebayyeh, A.A.R.M., Danishvar, S., and Mousavi, A., An Improved Capsule Network (WaferCaps) for Wafer Bin Map Classification Based on DCGAN Data Upsampling; TSM Feb. 2022 50-59

Ahn, J., Kim, D., Song, M., Min, J., Hwang, J., Kwon, J., and Kim, H., ℓ₁ Trend Filtering-Based Change Point Detection for Pumping Line Balance of Deposition Equipment; TSM Feb. 2022 137-145

Al Dujaili, A., see Lang, C.I., TSM Aug. 2022 457-469

Alcaire, T., Le Cunff, D., Soulan, S., and Tortai, J., On the Fly Ellipsometry Imaging for Process Deviation Detection; *TSM Aug. 2022 432-438*

Alfred, P., see Lang, C.I., TSM Aug. 2022 457-469

Ali Zargar, O., see Lin, T., TSM Feb. 2022 110-117

Ali Zargar, O., see Lin, T., TSM Feb. 2022 118-127

Ali Zargar, O., see Lin, T., TSM May 2022 353-362

Ali Zargar, O., see Lin, T., TSM May 2022 332-340

Ali Zargar, O., see Benalcazar, D., TSM Nov. 2022 670-679

An, D.W., Kim, S., Kim, H.K., and Kim, C.O., Commonality Analysis for Detecting Failures Caused by Inspection Tools in Semiconductor Manufacturing Processes; TSM Nov. 2022 596-604

В

Barber, G., see McLaughlin, M.P., TSM Aug. 2022 418-424

Bartal, Z., see Frascaroli, J., TSM Aug. 2022 540-545

Benalcazar, D., Lin, T., Hu, M., Ali Zargar, O., Lin, S., Shih, Y., and Leggett, G., A Numerical Study on the Effects of Purge and Air Curtain Flow Rates on Humidity Invasion Into a Front Opening Unified Pod (FOUP); TSM Nov. 2022 670-679

Benn, E., see McLaughlin, M.P., TSM Aug. 2022 418-424

Besacier, M., see Reche, J., TSM Aug. 2022 425-431

Bickford, J.P., see Patterson, O.D., TSM Aug. 2022 381-384

Blancquaert, Y., see Reche, J., TSM Aug. 2022 425-431

Bonam, S., Joseph, J., Hemanth Kumar, C., Panigrahi, A.K., Vanjari, S.R.K., and Singh, S.G., Fabrication of On-Silicon Aperture Coupled Patch Antenna Through Micromachining and Cu-Cu Thermocompression Bonding; TSM Nov. 2022 626-632

Boning, D.S., see Lang, C.I., TSM May 2022 229-240

Boning, D.S., see Lang, C.I., TSM Aug. 2022 511-521

Boning, D.S., see Lang, C.I., TSM Aug. 2022 457-469

Boning, D.S., see Lang, C.I., TSM Aug. 2022 580-584

Bowers, A., see Lang, C.I., TSM Aug. 2022 457-469

Breton, M., see Schmidt, D., TSM Aug. 2022 412-417

Buengener, R., Zhao, J., Ding, S., Zheng, X., Zhang, D., Wang, C., and Wang, J., Nondestructive Detection of Buried and Latent Defects by Negative Mode E-Beam Inspection; TSM Aug. 2022 405-411

Buengener, R., see Patterson, O.D., TSM Aug. 2022 381-384

 \mathbf{C}

Cao, Z., Goritz, A., Stocchi, M., Wietstruck, M., Hoyer, C., Steinweg, L.D., Carta, C., Ellinger, F., Tillack, B., and Kaynak, M., An Advanced Finite Element Model for BiCMOS Process Oriented Ultra-Thin Wafer Deformation; TSM Feb. 2022 2-10

Cardillo, P., see Lang, C.I., TSM Aug. 2022 457-469

Carta, C., see Cao, Z., TSM Feb. 2022 2-10

Cepler, A., see Schmidt, D., TSM Aug. 2022 412-417

Chen, H., see Lin, T., TSM Feb. 2022 110-117

Chen, H., see Wang, C., TSM Nov. 2022 610-619

Chen, J.C., Chen, T., Hu, H., Peng, P., and Lin, T., Multiobjective Order Promising for Outsourcing Supply Network of IC Design Houses; TSM Nov. 2022 680-697

Chen, J.E., see Li, K.S., TSM May 2022 291-299

Chen, J.E., see Li, K.S., TSM May 2022 272-281

Chen, K., see Liu, X., TSM Aug. 2022 504-510

Chen, K.S., Yu, C.M., and Huang, M.L., Fuzzy Selection Model for Quality-Based IC Packaging Process Outsourcers; TSM Feb. 2022 102-109

Chen, L.L., see Li, K.S., TSM May 2022 291-299

Chen, L.L., see Li, K.S., TSM May 2022 372-374

Chen, L.L., see Li, K.S., TSM May 2022 272-281

Chen, N., see Wang, R., TSM Aug. 2022 485-494

Chen, R., see Shao, H., TSM May 2022 309-317

Chen, T., see Chen, J.C., TSM Nov. 2022 680-697 **Chen, W.,** see Yang, H., TSM Feb. 2022 67-77

Cheng, K.C., see Li, K.S., TSM May 2022 372-374

Cheng, K.C., see Li, K.S., TSM May 2022 272-281

Chien, C., Hung, W., and Liao, E.T., Redefining Monitoring Rules for Intelligent Fault Detection and Classification via CNN Transfer Learning for Smart Manufacturing; TSM May 2022 158-165

Chien, C., Ling, Y., Kao, S., and Lin, C., Image-Based Defect Classification for TFT-LCD Array via Convolutional Neural Network; TSM Nov. 2022 650-657

Chiu, J., see Yeh, C., TSM Feb. 2022 11-15

Chiu, J., see Wang, C., TSM May 2022 210-219

Cho, G., Kwon, Y., Kareem, P., and Shin, Y., Integrated Test Pattern Extraction and Generation for Accurate Lithography Modeling; TSM Aug. 2022 495-503

Choi, J., see Lee, M.Y., TSM May 2022 282-290

Choi, J.E., Park, H., Lee, Y., and Hong, S.J., Virtual Metrology for Etch Profile in Silicon Trench Etching With SF₆/O₂/Ar Plasma; TSM Feb. 2022 128-136

Choi, J.E., see Kim, S.H., TSM May 2022 174-185

Choi, Y.J., see Lee, M.Y., TSM May 2022 282-290

Chou, J., Syu, R., Lai, C., Kuo, P., Yang, P., Nien, Y., Lin, Y., Yong, Z., and Wu, Y., Optimization and Application of TiO₂ Hollow Microsphere Modified Scattering Layer for the Photovoltaic Conversion Efficiency of Dye-Sensitized Solar Cell; TSM May 2022 363-371

Chou, L., see Li, K.S., TSM May 2022 372-374

Chou, L., see Li, K.S., TSM May 2022 272-281

Chuang, T., see Yeh, C., TSM Feb. 2022 11-15

Cohen, J., Jiang, B., and Ni, J., EveSyncIAI: Event Synchronization Industrial Augmented Intelligence for Fault Diagnosis; TSM Aug. 2022 446-456

Colombo, S., see Frascaroli, J., TSM Aug. 2022 540-545

Connolly, J., see Reiter, T., TSM Feb. 2022 60-66

Cowell, E.W., see Williams, B., TSM Aug. 2022 439-445

D

Dai, X., see Zhong, B., TSM Feb. 2022 146-148

Danishvar, S., see Abu Ebayyeh, A.A.R.M., TSM Feb. 2022 50-59

Dass, S.N., and Feng, C.J., Change Qualification Framework in Semiconductor Manufacturing; TSM Feb. 2022 87-101

Davis, R., see Williams, B., TSM Aug. 2022 439-445

de la Rosa, F.L., see Gomez-Sirvent, J.L., TSM May 2022 324-331

De Poortere, E.P., see Schelcher, G., TSM Aug. 2022 478-484

Deng, A., see Lu, J., TSM May 2022 318-323

Didari, S., see Lang, C.I., TSM May 2022 229-240

Diebold, A., see Susto, G.A., TSM May 2022 155-157

Diebold, A., Editorial; TSM May 2022 154

Dillon, J., see Lang, C.I., TSM Aug. 2022 457-469

Ding, S., see Buengener, R., TSM Aug. 2022 405-411

Djurdjanovic, D., see Zhang, H., TSM May 2022 241-255

Do, H., Lee, C., and Kim, S.B., A Hierarchical Spatial-Test Attention Network for Explainable Multiple Wafer Bin Maps Classification; TSM Feb. 2022 78-86

Dong, L., see Shao, H., TSM May 2022 309-317

Durfee, C., see Schmidt, D., TSM Aug. 2022 412-417

E

Eberts, D., see Flechsig, C., TSM Aug. 2022 397-404

Ehm, H., see Ratusny, M., TSM Aug. 2022 470-477

Ellinger, F., see Cao, Z., TSM Feb. 2022 2-10

Eriguchi, K., see Kajiwara, K., TSM Nov. 2022 620-625

F

Fan, S.S., Tsai, D., Jen, C., Hsu, C., He, F., and Juan, L., Data Visualization of Anomaly Detection in Semiconductor Processing Tools; TSM May 2022 186-197

Fan, T., see Shao, H., TSM May 2022 309-317

Feng, C.J., see Dass, S.N., TSM Feb. 2022 87-101

Feng, T., see Zhang, H., TSM May 2022 241-255

Fernandez-Caballero, A., see Gomez-Sirvent, J.L., TSM May 2022 324-331

Flechsig, C., Lohmer, J., Lasch, R., Zettler, B., Schneider, G., and Eberts, D., Streamlining Semiconductor Manufacturing of 200 mm and 300 mm Wafers: A Longitudinal Case Study on the Lot-to-Order-Matching Process; TSM Aug. 2022 397-404

Frascaroli, J., Tonini, M., Colombo, S., Livellara, L., Mariani, L., Targa, P., Fumagalli, R., Samu, V., Nagy, M., Molnar, G., Horvath, A., Bartal, Z., Kiss, Z., Sipocz, T., and Mica, I., Automatic Defect Detection in Epitaxial Layers by Micro Photoluminescence Imaging; TSM Aug. 2022 540-545

Freychet, G., see Reche, J., TSM Aug. 2022 425-431

Frougier, J., see Schmidt, D., TSM Aug. 2022 412-417

Fumagalli, R., see Frascaroli, J., TSM Aug. 2022 540-545

Furmans, K., see Schelthoff, K., TSM Aug. 2022 546-555

Fusegawa, K., see Kajiwara, K., TSM Nov. 2022 620-625

G

Gao, H., see Zhang, H., TSM Aug. 2022 522-531

Gao, R., Jiang, C., Lang, X., Zheng, Z., Jiang, J., and Huang, P., Study on Mechanical Cleavage Mechanism of GaAs via Anisotropic Stress Field and Experiments; TSM Nov. 2022 633-640

Gao, X., see Zhang, H., TSM Aug. 2022 522-531

Gao, Y., see Zhang, F., TSM May 2022 300-308

Gennari, F., see Yang, H., TSM Feb. 2022 67-77

Gergaud, P., see Reche, J., TSM Aug. 2022 425-431

Gomez-Sirvent, J.L., de la Rosa, F.L., Sanchez-Reolid, R., Fernandez-Caballero, A., and Morales, R., Optimal Feature Selection for Defect Classification in Semiconductor Wafers; TSM May 2022 324-331

Goritz, A., see Cao, Z., TSM Feb. 2022 2-10

Greene, A., see Schmidt, D., TSM Aug. 2022 412-417

Greenwood, B., see Williams, B., TSM Aug. 2022 439-445

Н

Halder, S., see Schelcher, G., TSM Aug. 2022 478-484

Han, G.C., see Li, K.S., TSM May 2022 272-281

Harada, K., see Kajiwara, K., TSM Nov. 2022 620-625

Haughey, S., see Reiter, T., TSM Feb. 2022 60-66

He, F., see Fan, S.S., TSM May 2022 186-197

Hemanth Kumar, C., see Bonam, S., TSM Nov. 2022 626-632

Heo, T., Kim, Y., and Kim, C.O., A Modified Lasso Model for Yield Analysis Considering the Interaction Effect in a Multistage Manufacturing Line; TSM Feb. 2022 32-39

Hoffman, N., see McLaughlin, M.P., TSM Aug. 2022 418-424

Hong, S., Hwang, I., and Jang, Y.J., Practical Q-Learning-Based Route-Guidance and Vehicle Assignment for OHT Systems in Semiconductor Fabs; TSM Aug. 2022 385-396

Hong, S.J., see Choi, J.E., TSM Feb. 2022 128-136

Hong, S.J., see Kim, S.H., TSM May 2022 174-185

Horvath, A., see Frascaroli, J., TSM Aug. 2022 540-545

Hourai, M., see Kajiwara, K., TSM Nov. 2022 620-625

Hoyer, C., see Cao, Z., TSM Feb. 2022 2-10

Hsu, C., see Li, K.S., TSM May 2022 291-299

Hsu, C., Lu, Y., and Yan, J., Temporal Convolution-Based Long-Short Term Memory Network With Attention Mechanism for Remaining Useful Life Prediction; TSM May 2022 220-228

Hsu, C., see Fan, S.S., TSM May 2022 186-197

Hsu, C., see Li, K.S., TSM May 2022 272-281

Hu, H., see Chen, J.C., TSM Nov. 2022 680-697

Hu, M., see Lin, T., TSM May 2022 353-362

Hu, M., see Lin, T., TSM May 2022 332-340

Hu, M., see Benalcazar, D., TSM Nov. 2022 670-679

Hu, S., see Lin, T., TSM Feb. 2022 110-117

Hu, S., see Lin, T., TSM Feb. 2022 118-127

Hu, Y., see Zhong, B., TSM Feb. 2022 146-148

Huang, A.Y., see Li, K.S., TSM May 2022 291-299

Huang, A.Y., see Li, K.S., TSM May 2022 372-374

Huang, A.Y., see Li, K.S., TSM May 2022 272-281 **Huang, M.L.,** see Chen, K.S., TSM Feb. 2022 102-109

Huang, P., see Gao, R., TSM Nov. 2022 633-640

Huang, R., see Zhang, W., TSM Nov. 2022 605-609

Huang, Y., see Lin, T., TSM Feb. 2022 110-117

Hung, F.Y., see Zhao, J.R., TSM Nov. 2022 698-705

Hung, W., see Chien, C., TSM May 2022 158-165

Hwang, I., see Hong, S., TSM Aug. 2022 385-396

Hwang, J., see Ahn, J., TSM Feb. 2022 137-145

I

Isaacson, R.L., see McLaughlin, M.P., TSM Aug. 2022 418-424

J

Jacobi, C., see Schelthoff, K., TSM Aug. 2022 546-555

Jang, Y.J., see Hong, S., TSM Aug. 2022 385-396

Jansen, A., see Lang, C.I., TSM May 2022 229-240

Janus, M., see Schelthoff, K., TSM Aug. 2022 546-555

Jebril, H.T.T., Pleschberger, M., and Susto, G.A., An Autoencoder-Based Approach for Fault Detection in Multi-Stage Manufacturing: A Sputter Deposition and Rapid Thermal Processing Case Study; TSM May 2022 166-173

Jen, C., see Fan, S.S., TSM May 2022 186-197

Jia, R., see Zhang, J., TSM May 2022 266-271

Jiang, B., see Cohen, J., TSM Aug. 2022 446-456

Jiang, C., see Gao, R., TSM Nov. 2022 633-640

Jiang, J., see Gao, R., TSM Nov. 2022 633-640

Jiang, X., see Li, K.S., TSM May 2022 291-299

Joo, S., see Nam, Y., TSM Aug. 2022 532-539

Joseph, J., see Bonam, S., TSM Nov. 2022 626-632

Juan, L., see Fan, S.S., TSM May 2022 186-197

K

Kajiwara, K., Eriguchi, K., Fusegawa, K., Mitsugi, N., Samata, S., Torigoe, K., Harada, K., Hourai, M., and Nishizawa, S., Nitrogen-Doped Czochralski Silicon Wafers as Materials for Conventional and Scaled Insulated Gate Bipolar Transistors; TSM Nov. 2022 620-625

Kao, S., see Chien, C., TSM Nov. 2022 650-657

Kareem, P., see Cho, G., TSM Aug. 2022 495-503

Kaynak, M., see Cao, Z., TSM Feb. 2022 2-10

Khatumria, C., see McLaughlin, M.P., TSM Aug. 2022 418-424

Kim, C.O., see Heo, T., TSM Feb. 2022 32-39

Kim, C.O., see Lee, M.Y., TSM May 2022 282-290

Kim, C.O., see An, D.W., TSM Nov. 2022 596-604

Kim, C.Y., see Kim, S.H., TSM May 2022 174-185

Kim, D., see Ahn, J., TSM Feb. 2022 137-145

Kim, D., see Nam, Y., TSM Aug. 2022 532-539

Kim, H., see Ahn, J., TSM Feb. 2022 137-145

Kim, H.K., see An, D.W., TSM Nov. 2022 596-604

Kim, K., see Kwon, O., TSM May 2022 256-265

Kim, K., see Nam, Y., TSM Aug. 2022 532-539

Kim, S., see An, D.W., TSM Nov. 2022 596-604

Kim, S.B., see Do, H., TSM Feb. 2022 78-86

Kim, S.H., Kim, C.Y., Seol, D.H., Choi, J.E., and Hong, S.J., Machine Learning-Based Process-Level Fault Detection and Part-Level Fault Classification in Semiconductor Etch Equipment; TSM May 2022 174-185

Kim, Y., see Heo, T., TSM Feb. 2022 32-39

Kiss, Z., see Frascaroli, J., TSM Aug. 2022 540-545

Kissoon, N., see Schelcher, G., TSM Aug. 2022 478-484

Klare, M., see Schmidt, D., TSM Aug. 2022 412-417

Kong, Y., and Ni, D., A One-Shot Learning Approach for Similarity Retrieval of Wafer Bin Maps With Unknown Failure Pattern; TSM Feb. 2022 40-49

Koret, R., see Schmidt, D., TSM Aug. 2022 412-417

Kothnur, P., see Lang, C.I., TSM May 2022 229-240

Kuo, P., see Chou, J., TSM May 2022 363-371

Kwak, N., see Nam, Y., TSM Aug. 2022 532-539

Kwon, J., see Ahn, J., TSM Feb. 2022 137-145

Kwon, O., Lee, N., and Kim, K., Improvement of Virtual Diagnostics Performance for Plasma Density in Semiconductor Etch Equipment Using Variational Auto-Encoder; TSM May 2022 256-265

Kwon, Y., see Cho, G., TSM Aug. 2022 495-503

Kyek, A., see Susto, G.A., TSM May 2022 155-157

L

Lai, C., see Chou, J., TSM May 2022 363-371

Lai, W., see Lin, T., TSM May 2022 332-340

Lai, Y., see Yang, H., TSM Feb. 2022 67-77

Lang, C.I., Jansen, A., Didari, S., Kothnur, P., and Boning, D.S., Modeling and Optimizing the Impact of Process and Equipment Parameters in Sputtering Deposition Systems Using a Gaussian Process Machine Learning Framework; TSM May 2022 229-240

Lang, C.I., Sun, F., Veerasingam, R., Yamartino, J., and Boning, D.S., Understanding and Improving Virtual Metrology Systems Using Bayesian Methods; TSM Aug. 2022 511-521

Lang, C.I., Sun, F., Lawler, B., Dillon, J., Al Dujaili, A., Ruth, J., Cardillo, P., Alfred, P., Bowers, A., Mckiernan, A., and Boning, D.S., One Class Process Anomaly Detection Using Kernel Density Estimation Methods; TSM Aug. 2022 457-469

Lang, C.I., Sprenkle, R., Wilson, E., Samolov, A., and Boning, D.S., Intelligent Optimization of Dosing Uniformity in Ion Implantation Systems; TSM Aug. 2022 580-584 Lang, X., see Gao, R., TSM Nov. 2022 633-640

Lasch, R., see Flechsig, C., TSM Aug. 2022 397-404

Lawler, B., see Lang, C.I., TSM Aug. 2022 457-469

Le Cunff, D., see Alcaire, T., TSM Aug. 2022 432-438

Le Cunff, D., see Patterson, O.D., TSM Aug. 2022 381-384

Lee, C., see Do, H., TSM Feb. 2022 78-86

Lee, C., see Yeh, C., TSM Feb. 2022 11-15

Lee, C., see Susto, G.A., TSM May 2022 155-157

Lee, C., see Shen, P., TSM May 2022 198-209

Lee, C., see Li, K.S., TSM May 2022 372-374

Lee, C., see Li, K.S., TSM May 2022 272-281

Lee, G.T., see Lee, M.Y., TSM May 2022 282-290

Lee, M.Y., Choi, Y.J., Lee, G.T., Choi, J., and Kim, C.O., Attention Mechanism-Based Root Cause Analysis for Semiconductor Yield Enhancement Considering the Order of Manufacturing Processes; TSM May 2022 282-290

Lee, N., see Kwon, O., TSM May 2022 256-265

Lee, Y., see Choi, J.E., TSM Feb. 2022 128-136

Leggett, G., see Lin, T., TSM Feb. 2022 110-117

Leggett, G., see Lin, T., TSM Feb. 2022 118-127

Leggett, G., see Lin, T., TSM May 2022 353-362

Leggett, G., see Lin, T., TSM May 2022 332-340

Leggett, G., see Benalcazar, D., TSM Nov. 2022 670-679

Eeggett, G, see Bendedzai, B., 15/11/10/. 2022 0/0 0/

Leray, P., see Schelcher, G., TSM Aug. 2022 478-484

Li, C., see Shao, H., TSM May 2022 309-317

Li, K.S., Jiang, X., Chen, L.L., Wang, S., Huang, A.Y., Chen, J.E., Liang, H., and Hsu, C., Wafer Defect Pattern Labeling and Recognition Using Semi-Supervised Learning; TSM May 2022 291-299

Li, K.S., Chen, L.L., Cheng, K.C., Liao, P.Y., Wang, S., Huang, A.Y., Chou, L., Tsai, N.C., and Lee, C., TestDNA-E: Wafer Defect Signature for Pattern Recognition by Ensemble Learning; TSM May 2022 372-374

Li, K.S., Chen, L.L., Liao, P.Y., Wang, S., Huang, A.Y., Chou, L., Tsai, N.C., Cheng, K.C., Han, G.C., Lee, C., Chen, J.E., Liang, H., and Hsu, C., Wafer Scratch Pattern Reconstruction for High Diagnosis Accuracy and Yield Optimization; TSM May 2022 272-281

Li, S., see Yang, H., TSM Feb. 2022 67-77

Li, X., see Zhang, F., TSM May 2022 300-308

Liang, H., see Li, K.S., TSM May 2022 291-299

Liang, H., see Li, K.S., TSM May 2022 272-281

Liao, E.T., see Chien, C., TSM May 2022 158-165

Liao, P.Y., see Li, K.S., TSM May 2022 372-374

Liao, P.Y., see Li, K.S., TSM May 2022 272-281

Lin, C., see Yeh, C., TSM Feb. 2022 11-15

Lin, C., see Lin, T., TSM May 2022 353-362

Lin, C., see Chien, C., TSM Nov. 2022 650-657

Lin, S., see Benalcazar, D., TSM Nov. 2022 670-679

Lin, T., Ali Zargar, O., Chen, H., Huang, Y., Hu, S., and Leggett, G., A Comparative Study on Velocity Fields, Humidity and Oxygen Concentration in a Front Opening Unified Pod (FOUP) During Purge; TSM Feb. 2022 110-117

Lin, T., Ali Zargar, O., Mallillin, A.M., Hu, S., and Leggett, G., Parametric Optimization for Moisture Infiltration Prevention Into a FOUP (Front Opening Unified Pod); TSM Feb. 2022 118-127

Lin, T., Ali Zargar, O., Hu, M., Lin, C., and Leggett, G., The Effect of Purge Flow Rate and Wafer Arrangement on Humidity Invasion Into a Loaded Front Opening Unified Pod (FOUP); TSM May 2022 353-362

Lin, T., Hu, M., Ali Zargar, O., Lai, W., and Leggett, G., Improving Liquid Film Thickness Uniformity of Semiconductor Etching Equipment Using Flow Field Visualization and CFD Simulation; TSM May 2022 332-340

Lin, T., see Chen, J.C., TSM Nov. 2022 680-697

Lin, T., see Benalcazar, D., TSM Nov. 2022 670-679

Lin, Y., see Chou, J., TSM May 2022 363-371

Ling, Y., see Chien, C., TSM Nov. 2022 650-657

Linnane, M., see McLaughlin, M.P., TSM Aug. 2022 418-424

Liu, C.W., see Yeh, C., TSM Feb. 2022 11-15

Liu, D., see Ren, J., TSM Nov. 2022 658-669

Liu, X., Radfar, B., Chen, K., Setala, O.E., Pasanen, T.P., Yli-Koski, M., Savin, H., and Vahanissi, V., Perspectives on Black Silicon in Semiconductor

Manufacturing: Experimental Comparison of Plasma Etching, MACE, and Fs-Laser Etching; TSM Aug. 2022 504-510

Livellara, L., see Frascaroli, J., TSM Aug. 2022 540-545

Lohmer, J., see Flechsig, C., TSM Aug. 2022 397-404

Lu, J., Deng, A., and Xiao, P., Preparation and Application of Sol-Gel Polishing Pad for Polishing CVD Single Crystal Diamond at High Speed; TSM May 2022 318-323

Lu, J., Ma, Z., and Lv, X., Study on Polishing of Polycrystalline AlN Using Sol–Gel Polishing Tool; TSM Nov. 2022 641-649

Lu, X., see Wang, C., TSM Feb. 2022 24-31

Lu, Y., see Hsu, C., TSM May 2022 220-228

Lv, X., see Lu, J., TSM Nov. 2022 641-649

M

Ma, Y., see Yu, D., TSM Aug. 2022 556-568

Ma, Z., see Lu, J., TSM Nov. 2022 641-649

Mallillin, A.M., see Lin, T., TSM Feb. 2022 118-127

Mariani, L., see Frascaroli, J., TSM Aug. 2022 540-545

McCann, M., see Reiter, T., TSM Feb. 2022 60-66

Mckiernan, A., see Lang, C.I., TSM Aug. 2022 457-469

McLaughlin, M.P., Mennell, P., Stamper, A., Barber, G., Paduano, J., Benn, E., Linnane, M., Zwick, J., Khatumria, C., Isaacson, R.L., Hoffman, N., and Menser, C., Improved Color Defect Detection With Machine Learning for After Develop Inspections in Lithography; TSM Aug. 2022 418-424

McManus, M., see Schelcher, G., TSM Aug. 2022 478-484

Mennell, P., see McLaughlin, M.P., TSM Aug. 2022 418-424

Menser, C., see McLaughlin, M.P., TSM Aug. 2022 418-424

Mica, I., see Frascaroli, J., TSM Aug. 2022 540-545

Min, J., see Ahn, J., TSM Feb. 2022 137-145

Mitsugi, N., see Kajiwara, K., TSM Nov. 2022 620-625

Molnar, G., see Frascaroli, J., TSM Aug. 2022 540-545

Morales, R., see Gomez-Sirvent, J.L., TSM May 2022 324-331

Mousavi, A., see Abu Ebayyeh, A.A.R.M., TSM Feb. 2022 50-59

Mulkens, J., see Schelcher, G., TSM Aug. 2022 478-484

N

Nagy, M., see Frascaroli, J., TSM Aug. 2022 540-545

Nam, Y., Joo, S., Kwak, N., Kim, K., and Kim, D., Precise Pattern Alignment for Die-to-Database Inspection Based on the Generative Adversarial Network; TSM Aug. 2022 532-539

Ni, D., see Kong, Y., TSM Feb. 2022 40-49

Ni, J., see Cohen, J., TSM Aug. 2022 446-456

Nien, Y., see Chou, J., TSM May 2022 363-371

Nishizawa, S., see Kajiwara, K., TSM Nov. 2022 620-625

P

Paduano, J., see McLaughlin, M.P., TSM Aug. 2022 418-424

Pancharatnam, S., see Schmidt, D., TSM Aug. 2022 412-417

Panigrahi, A.K., see Bonam, S., TSM Nov. 2022 626-632

Paolillo, S., see Schelcher, G., TSM Aug. 2022 478-484

Park, H., see Choi, J.E., TSM Feb. 2022 128-136

Pasanen, T.P., see Liu, X., TSM Aug. 2022 504-510

Patel, N.S., see Susto, G.A., TSM May 2022 155-157

Pathak, P., see Yang, H., TSM Feb. 2022 67-77

Patil, D., and Son, S., A Practical Approach for Managing End-of-Life Systems in Semiconductor Manufacturing Using Health Index; TSM Aug. 2022 569-579

Patterson, O.D., Le Cunff, D., Buengener, R., Radloff, S., Werbaneth, P., and Bickford, J.P., Guest Editorial Special Section on the 2020 and 2021 SEMI Advanced Semiconductor Manufacturing Conferences; TSM Aug. 2022 381-384

Peng, P., see Chen, J.C., TSM Nov. 2022 680-697

Pleschberger, M., see Jebril, H.T.T., TSM May 2022 166-173

Plohmann, D., see Schelthoff, K., TSM Aug. 2022 546-555

Q

Qi, Y., see Zhang, H., TSM Aug. 2022 522-531

R

Radfar, B., see Liu, X., TSM Aug. 2022 504-510

Radloff, S., see Patterson, O.D., TSM Aug. 2022 381-384

Rahman, M.R.U., see Wang, C., TSM Nov. 2022 610-619

Ratusny, M., Schiffer, M., and Ehm, H., Customer Order Behavior Classification Via Convolutional Neural Networks in the Semiconductor Industry; TSM Aug. 2022 470-477

Reche, J., Gergaud, P., Blancquaert, Y., Besacier, M., and Freychet, G., Shape and Roughness Extraction of Line Gratings by Small Angle X-Ray Scattering: Statistics and Simulations; TSM Aug. 2022 425-431

Reiter, T., McCann, M., Connolly, J., and Haughey, S., An Investigation of Edge Bead Removal Width Variability, Effects and Process Control in Photolithographic Manufacturing; TSM Feb. 2022 60-66

Ren, J., Liu, D., and Wan, Y., Data-Driven and Mechanism-Based Hybrid Model for Semiconductor Silicon Monocrystalline Quality Prediction in the Czochralski Process; TSM Nov. 2022 658-669

Ruth, J., see Lang, C.I., TSM Aug. 2022 457-469

Ruud, T., see Williams, B., TSM Aug. 2022 439-445

.

Samata, S., see Kajiwara, K., TSM Nov. 2022 620-625

Samolov, A., see Lang, C.I., TSM Aug. 2022 580-584

Samu, V., see Frascaroli, J., TSM Aug. 2022 540-545

Sanchez-Reolid, R., see Gomez-Sirvent, J.L., TSM May 2022 324-331

Savin, H., see Liu, X., TSM Aug. 2022 504-510

Schelcher, G., De Poortere, E.P., Kissoon, N., Paolillo, S., Silva, M.d.A.C.e., Zhang, Y., Tabery, C., Mulkens, J., McManus, M., Leray, P., and Halder, S., E-Test Validation of Space Error Budget and Metrology; TSM Aug. 2022 478-484

Schelthoff, K., Jacobi, C., Schlosser, E., Plohmann, D., Janus, M., and Furmans, K., Feature Selection for Waiting Time Predictions in Semiconductor Wafer Fabs; TSM Aug. 2022 546-555

Schiffer, M., see Ratusny, M., TSM Aug. 2022 470-477

Schlosser, E., see Schelthoff, K., TSM Aug. 2022 546-555

Schmidt, D., Cepler, A., Durfee, C., Pancharatnam, S., Frougier, J., Breton, M., Greene, A., Klare, M., Koret, R., and Turovets, I., Development of SiGe Indentation Process Control for Gate-All-Around FET Technology Enablement; TSM Aug. 2022 412-417

Schneider, G., see Flechsig, C., TSM Aug. 2022 397-404

Seol, D.H., see Kim, S.H., TSM May 2022 174-185

Setala, O.E., see Liu, X., TSM Aug. 2022 504-510

Shao, H., Chen, R., Dong, L., Li, C., Yan, Q., Fan, T., and Wei, Y., High Accuracy Simulation of Silicon Oxynitride Film Grown by Plasma Enhanced Chemical Vapor Deposition; *TSM May 2022 309-317*

Shen, P., and Lee, C., Wafer Bin Map Recognition With Autoencoder-Based Data Augmentation in Semiconductor Assembly Process; *TSM May 2022*

Shih, Y., see Benalcazar, D., TSM Nov. 2022 670-679

Shin, Y., see Cho, G., TSM Aug. 2022 495-503

Silva, M.d.A.C.e., see Schelcher, G., TSM Aug. 2022 478-484

Singh, S.G., see Bonam, S., TSM Nov. 2022 626-632

Sipocz, T., see Frascaroli, J., TSM Aug. 2022 540-545

Son, S., see Patil, D., TSM Aug. 2022 569-579

Song, M., see Ahn, J., TSM Feb. 2022 137-145

Soulan, S., see Alcaire, T., TSM Aug. 2022 432-438

Sprenkle, R., see Lang, C.I., TSM Aug. 2022 580-584

Stamper, A., see McLaughlin, M.P., TSM Aug. 2022 418-424

Steinweg, L.D., see Cao, Z., TSM Feb. 2022 2-10

Stocchi, M., see Cao, Z., TSM Feb. 2022 2-10

Sun, F., see Lang, C.I., TSM Aug. 2022 511-521

Sun, F., see Lang, C.I., TSM Aug. 2022 457-469

Sun, M., see Yang, Y., TSM Feb. 2022 16-23

Susto, G.A., Diebold, A., Kyek, A., Lee, C., and Patel, N.S., Guest Editorial Process-Level Machine Learning Applications in Semiconductor Manufacturing: TSM May 2022 155-157

Susto, G.A., see Jebril, H.T.T., TSM May 2022 166-173

Syu, R., see Chou, J., TSM May 2022 363-371

Т

Tabery, C., see Schelcher, G., TSM Aug. 2022 478-484 **Tao**, Q., see Zhang, F., TSM May 2022 300-308 **Targa**, P., see Frascaroli, J., TSM Aug. 2022 540-545 **Tian**, F., see Wang, C., TSM Feb. 2022 24-31

Tillack, B., see Cao, Z., TSM Feb. 2022 2-10

Tonini, M., see Frascaroli, J., TSM Aug. 2022 540-545

Torigoe, K., see Kajiwara, K., TSM Nov. 2022 620-625

Tortai, J., see Alcaire, T., TSM Aug. 2022 432-438

Tsai, D., see Fan, S.S., TSM May 2022 186-197

Tsai, N.C., see Li, K.S., TSM May 2022 372-374

Tsai, N.C., see Li, K.S., TSM May 2022 272-281

Turovets, I., see Schmidt, D., TSM Aug. 2022 412-417

U

Uzsoy, R., Editorial; TSM Feb. 2022 1 Uzsoy, R., Editorial; TSM May 2022 153

Uzsoy, R., Editorial; TSM Nov. 2022 595

V

Vahanissi, V., see Liu, X., TSM Aug. 2022 504-510 Vanjari, S.R.K., see Bonam, S., TSM Nov. 2022 626-632 Veerasingam, R., see Lang, C.I., TSM Aug. 2022 511-521

W

Wan, Y., see Ren, J., TSM Nov. 2022 658-669

Wang, C., Wang, T., Tian, F., and Lu, X., Edge Effects of an Eddy-Current Thickness Sensor During Chemical Mechanical Polishing; *TSM Feb. 2022*

Wang, C., and Chiu, J., Shear Force Classification Before Wire Bonding Based on Probe Mark 2-D Images Using Machine Learning Methods; *TSM May* 2022 210, 219

Wang, C., see Buengener, R., TSM Aug. 2022 405-411

Wang, C., Chen, H., Zhao, S., and Rahman, M.R.U., Efficient and Refined Deep Convolutional Features Network for the Crack Segmentation of Solar Cell Electroluminescence Images; TSM Nov. 2022 610-619

Wang, H., see Zhang, F., TSM May 2022 300-308

Wang, H., see Wei, Y., TSM May 2022 341-352

Wang, J., see Buengener, R., TSM Aug. 2022 405-411

Wang, P., see Zhang, H., TSM Aug. 2022 522-531

Wang, R., and Chen, N., Detection and Recognition of Mixed-Type Defect Patterns in Wafer Bin Maps via Tensor Voting; TSM Aug. 2022 485-494

Wang, S., see Li, K.S., TSM May 2022 291-299

Wang, S., see Li, K.S., TSM May 2022 372-374

Wang, S., see Li, K.S., TSM May 2022 272-281

Wang, T., see Wang, C., TSM Feb. 2022 24-31

Wang, X., see Zhang, J., TSM May 2022 266-271

Wei, Y., and Wang, H., Mixed-Type Wafer Defect Recognition With Multi-Scale Information Fusion Transformer; TSM May 2022 341-352

Wei, Y., see Shao, H., TSM May 2022 309-317

Werbaneth, P., see Patterson, O.D., TSM Aug. 2022 381-384

Wietstruck, M., see Cao, Z., TSM Feb. 2022 2-10

Williams, B., Davis, R., Cowell, E.W., Yerger, J., Greenwood, B., and Ruud, T., Source Pad Design Tradeoffs for a Power TrenchFET; TSM Aug. 2022 439-445

Wilson, E., see Lang, C.I., TSM Aug. 2022 580-584

Wu, S.C., see Zhao, J.R., TSM Nov. 2022 698-705 **Wu, Y.,** see Yeh, C., TSM Feb. 2022 11-15

Wu, Y., see Chou, J., TSM May 2022 363-371

X

Xiao, P., see Lu, J., TSM May 2022 318-323

Y

Yamartino, J., see Lang, C.I., TSM Aug. 2022 511-521

Yan, J., see Hsu, C., TSM May 2022 220-228

Yan, Q., see Shao, H., TSM May 2022 309-317

Yan, Y., see Zhang, F., TSM May 2022 300-308

Yang, B., see Zhang, F., TSM May 2022 300-308

Yang, H., Li, S., Chen, W., Pathak, P., Gennari, F., Lai, Y., and Yu, B., DeePattern: Layout Pattern Generation With Transforming Convolutional Auto-Encoder; TSM Feb. 2022 67-77

Yang, P., see Chou, J., TSM May 2022 363-371

Yang, Y., and Sun, M., Semiconductor Defect Pattern Classification by Self-Proliferation-and-Attention Neural Network; TSM Feb. 2022 16-23

Yeh, C., Lee, C., Chiu, J., Wu, Y., Lin, C., Yu, C., Chuang, T., and Liu, C.W., Electrical Measurements to Detect Liquid Concentration; *TSM Feb. 2022*

Yerger, J., see Williams, B., TSM Aug. 2022 439-445

Yli-Koski, M., see Liu, X., TSM Aug. 2022 504-510

Yong, Z., see Chou, J., TSM May 2022 363-371

You, H., see Zhang, J., TSM May 2022 266-271

Yu, B., see Yang, H., TSM Feb. 2022 67-77

Yu, C., see Yeh, C., TSM Feb. 2022 11-15

Yu, C.M., see Chen, K.S., TSM Feb. 2022 102-109

Yu, D., and Ma, Y., Investigations of Fast Vacuum Pump-Down Processes Between Parallel Isothermal Disks; TSM Aug. 2022 556-568

7.

Zettler, B., see Flechsig, C., TSM Aug. 2022 397-404

Zhang, D., see Buengener, R., TSM Aug. 2022 405-411

Zhang, F., Tao, Q., Yan, Y., Li, X., Gao, Y., Yang, B., and Wang, H., Wafer Lot Assignment for Parallel-Producing Tools Based on Heuristic Clustering Algorithm; TSM May 2022 300-308

Zhang, F., see Zhang, F., TSM May 2022 300-308

Zhang, H., Feng, T., and Djurdjanovic, D., Dynamic Down-Selection of Measurement Markers for Optimized Robust Control of Overlay Errors in Photolithography Processes; TSM May 2022 241-255

Zhang, H., Wang, P., Gao, X., Qi, Y., and Gao, H., Data Visualization and Fault Detection Using Bi-Kernel t-Distributed Stochastic Neighbor Embedding in Semiconductor Etching Processes; TSM Aug. 2022 522-531

Zhang, J., You, H., Jia, R., and Wang, X., The Research on Screening Method to Reduce Chip Test Escapes by Using Multi-Correlation Analysis of Parameters; TSM May 2022 266-271

Zhang, W., and Huang, R., Study on the Transformation of Si Trench Profile With Low Pressure of SF₆/O₂ Containing Plasmas; *TSM Nov. 2022 605-609*

Zhang, Y., see Schelcher, G., TSM Aug. 2022 478-484

Zhao, J., see Buengener, R., TSM Aug. 2022 405-411

Zhao, J.R., Hung, F.Y., and Wu, S.C., Interface Characteristics, Erosion Behavior, and Thermal Shock Resistance of Al–Ta Alloy Coatings Produced by Arc Spraying; TSM Nov. 2022 698-705

Zhao, S., see Wang, C., TSM Nov. 2022 610-619

Zheng, D., see Zhong, B., TSM Feb. 2022 146-148

Zheng, X., see Buengener, R., TSM Aug. 2022 405-411

Zheng, Z., see Gao, R., TSM Nov. 2022 633-640

Zhong, B., Zheng, D., Dai, X., and Hu, Y., A Novel Automatic Probe-to-Pad Alignment Error Correction Approach; *TSM Feb. 2022 146-148*

Zwick, J., see McLaughlin, M.P., TSM Aug. 2022 418-424

Subject Index

Numeric

III-V semiconductor materials

Study on Polishing of Polycrystalline AlN Using Sol-Gel Polishing Tool. Lu, J., +, TSM Nov. 2022 641-649

A

Abrasion

Preparation and Application of Sol-Gel Polishing Pad for Polishing CVD Single Crystal Diamond at High Speed. Lu, J., +, TSM May 2022 318-323

Abrasives

Preparation and Application of Sol-Gel Polishing Pad for Polishing CVD Single Crystal Diamond at High Speed. Lu, J., +, TSM May 2022 318-323

Adaptation models

Data-Driven and Mechanism-Based Hybrid Model for Semiconductor Silicon Monocrystalline Quality Prediction in the Czochralski Process. *Ren, J., +, TSM Nov. 2022 658-669*

Adaptive control

Dynamic Down-Selection of Measurement Markers for Optimized Robust Control of Overlay Errors in Photolithography Processes. *Zhang, H.*, +, *TSM May 2022 241-255*

Alarm systems

ℓ₁ Trend Filtering-Based Change Point Detection for Pumping Line Balance of Deposition Equipment. Ahn, J., +, TSM Feb. 2022 137-145

Aluminum

Interface Characteristics, Erosion Behavior, and Thermal Shock Resistance of Al–Ta Alloy Coatings Produced by Arc Spraying. Zhao, J.R., +, TSM Nov. 2022 698-705

Source Pad Design Tradeoffs for a Power TrenchFET. Williams, B., +, TSM Aug. 2022 439-445

Aluminum nitride

Study on Polishing of Polycrystalline AlN Using Sol–Gel Polishing Tool. Lu, J., +, TSM Nov. 2022 641-649

Amorphous state

Preparation and Application of Sol-Gel Polishing Pad for Polishing CVD Single Crystal Diamond at High Speed. Lu, J., +, TSM May 2022 318-323

Analytical models

Study on Mechanical Cleavage Mechanism of GaAs via Anisotropic Stress Field and Experiments. *Gao*, R., +, TSM Nov. 2022 633-640

Anisotropic magnetoresistance

Study on Mechanical Cleavage Mechanism of GaAs via Anisotropic Stress Field and Experiments. *Gao, R.*, +, *TSM Nov. 2022 633-640*

Anomaly detection

Guest Editorial Process-Level Machine Learning Applications in Semiconductor Manufacturing. Susto, G.A., +, TSM May 2022 155-157

Antennas

Fabrication of On-Silicon Aperture Coupled Patch Antenna Through Micromachining and Cu-Cu Thermocompression Bonding. *Bonam, S.*, +, *TSM Nov. 2022 626-632*

Antireflection coatings

Perspectives on Black Silicon in Semiconductor Manufacturing: Experimental Comparison of Plasma Etching, MACE, and Fs-Laser Etching. *Liu, X.*, +, *TSM Aug. 2022 504-510*

Apertures

Fabrication of On-Silicon Aperture Coupled Patch Antenna Through Micromachining and Cu-Cu Thermocompression Bonding. *Bonam, S.*, +, *TSM Nov.* 2022 626-632

Artificial intelligence

Guest Editorial Process-Level Machine Learning Applications in Semiconductor Manufacturing. Susto, G.A., +, TSM May 2022 155-157

Optimal Feature Selection for Defect Classification in Semiconductor Wafers. Gomez-Sirvent, J.L., +, TSM May 2022 324-331

Assembling

Wafer Bin Map Recognition With Autoencoder-Based Data Augmentation in Semiconductor Assembly Process. Shen, P., +, TSM May 2022 198-209

Atmospheric modeling

A Numerical Study on the Effects of Purge and Air Curtain Flow Rates on Humidity Invasion Into a Front Opening Unified Pod (FOUP). *Benalcazar*, D., +, TSM Nov. 2022 670-679

Automatic optical inspection

An Improved Capsule Network (WaferCaps) for Wafer Bin Map Classification Based on DCGAN Data Upsampling. *Abu Ebayyeh, A.A.R.M.*, +, *TSM Feb. 2022 50-59*

Improved Color Defect Detection With Machine Learning for After Develop Inspections in Lithography. *McLaughlin, M.P.*, +, *TSM Aug. 2022 418-424* Optimal Feature Selection for Defect Classification in Semiconductor

Precise Pattern Alignment for Die-to-Database Inspection Based on the Generative Adversarial Network. Nam, Y., +, TSM Aug. 2022 532-539

B

Wafers. Gomez-Sirvent, J.L., +, TSM May 2022 324-331

Bayes methods

Intelligent Optimization of Dosing Uniformity in Ion Implantation Systems. Lang. C.I., +, TSM Aug. 2022 580-584

Understanding and Improving Virtual Metrology Systems Using Bayesian Methods. Lang, C.I., +, TSM Aug. 2022 511-521

BiCMOS integrated circuits

An Advanced Finite Element Model for BiCMOS Process Oriented Ultra-Thin Wafer Deformation. Cao, Z., +, TSM Feb. 2022 2-10

Bonding

Fabrication of On-Silicon Aperture Coupled Patch Antenna Through Micromachining and Cu-Cu Thermocompression Bonding. *Bonam, S.*, +, *TSM Nov. 2022 626-632*

Breakdown voltage

Nitrogen-Doped Czochralski Silicon Wafers as Materials for Conventional and Scaled Insulated Gate Bipolar Transistors. *Kajiwara, K.*, +, *TSM Nov.* 2022 620-625

Buried object detection

Nondestructive Detection of Buried and Latent Defects by Negative Mode E-Beam Inspection. *Buengener, R.*, +, *TSM Aug. 2022 405-411*

C

CAD

Precise Pattern Alignment for Die-to-Database Inspection Based on the Generative Adversarial Network. *Nam, Y., +, TSM Aug. 2022 532-539*

Calibration

Edge Effects of an Eddy-Current Thickness Sensor During Chemical Mechanical Polishing. Wang, C., +, TSM Feb. 2022 24-31

Capacitance measurement

Electrical Measurements to Detect Liquid Concentration. Yeh, C., +, TSM Feb. 2022 11-15

Ceramic capacitors

A Modified Lasso Model for Yield Analysis Considering the Interaction Effect in a Multistage Manufacturing Line. *Heo, T.*, +, *TSM Feb. 2022* 32-39

Ceramic products

A Modified Lasso Model for Yield Analysis Considering the Interaction Effect in a Multistage Manufacturing Line. *Heo, T.*, +, *TSM Feb. 2022 32-39*

Chemical mechanical polishing

Edge Effects of an Eddy-Current Thickness Sensor During Chemical Mechanical Polishing. Wang, C., +, TSM Feb. 2022 24-31

Preparation and Application of Sol-Gel Polishing Pad for Polishing CVD Single Crystal Diamond at High Speed. Lu, J., +, TSM May 2022 318-323

Chemical vapor deposition

Preparation and Application of Sol-Gel Polishing Pad for Polishing CVD Single Crystal Diamond at High Speed. Lu, J., +, TSM May 2022 318-323

Circuit analysis computing

DeePattern: Layout Pattern Generation With Transforming Convolutional Auto-Encoder. Yang, H., +, TSM Feb. 2022 67-77

Classification algorithms

Guest Editorial Process-Level Machine Learning Applications in Semiconductor Manufacturing. Susto, G.A., +, TSM May 2022 155-157

Clean rooms

A Comparative Study on Velocity Fields, Humidity and Oxygen Concentration in a Front Opening Unified Pod (FOUP) During Purge. *Lin*, *T*, +, *TSM Feb. 2022 110-117*

Parametric Optimization for Moisture Infiltration Prevention Into a FOUP (Front Opening Unified Pod). *Lin, T., +, TSM Feb. 2022 118-127*

The Effect of Purge Flow Rate and Wafer Arrangement on Humidity Invasion Into a Loaded Front Opening Unified Pod (FOUP). *Lin, T.*, +, *TSM May 2022 353-362*

Cleaning

A Comparative Study on Velocity Fields, Humidity and Oxygen Concentration in a Front Opening Unified Pod (FOUP) During Purge. *Lin*, *T.*, +, *TSM Feb. 2022 110-117*

Wafer Lot Assignment for Parallel-Producing Tools Based on Heuristic Clustering Algorithm. Zhang, F., +, TSM May 2022 300-308

Coatings

Interface Characteristics, Erosion Behavior, and Thermal Shock Resistance of Al–Ta Alloy Coatings Produced by Arc Spraying. Zhao, J.R., +, TSM Nov. 2022 698-705

Coils

Edge Effects of an Eddy-Current Thickness Sensor During Chemical Mechanical Polishing. Wang, C., +, TSM Feb. 2022 24-31

Composite materials

Optimization and Application of TiO₂ Hollow Microsphere Modified Scattering Layer for the Photovoltaic Conversion Efficiency of Dye-Sensitized Solar Cell. *Chou, J.*, +, *TSM May 2022 363-371*

Computational fluid dynamics

Improving Liquid Film Thickness Uniformity of Semiconductor Etching Equipment Using Flow Field Visualization and CFD Simulation. *Lin, T.,* +, *TSM May 2022 332-340*

Investigations of Fast Vacuum Pump-Down Processes Between Parallel Isothermal Disks. Yu, D., +, TSM Aug. 2022 556-568

Computer vision

Optimal Feature Selection for Defect Classification in Semiconductor Wafers. Gomez-Sirvent, J.L., +, TSM May 2022 324-331

Condition monitoring

ℓ₁ Trend Filtering-Based Change Point Detection for Pumping Line Balance of Deposition Equipment. Ahn, J., +, TSM Feb. 2022 137-145

A Practical Approach for Managing End-of-Life Systems in Semiconductor Manufacturing Using Health Index. Patil, D., +, TSM Aug. 2022 569-579

An Investigation of Edge Bead Removal Width Variability, Effects and Process Control in Photolithographic Manufacturing. *Reiter, T.*, +, *TSM Feb.* 2022 60-66

Redefining Monitoring Rules for Intelligent Fault Detection and Classification via CNN Transfer Learning for Smart Manufacturing. *Chien, C.*, +, *TSM May 2022 158-165*

Confined flow

Investigations of Fast Vacuum Pump-Down Processes Between Parallel Isothermal Disks. Yu, D., +, TSM Aug. 2022 556-568

Contamination

A Numerical Study on the Effects of Purge and Air Curtain Flow Rates on Humidity Invasion Into a Front Opening Unified Pod (FOUP). *Benalcazar*, D., +, TSM Nov. 2022 670-679

Parametric Optimization for Moisture Infiltration Prevention Into a FOUP (Front Opening Unified Pod). *Lin, T., +, TSM Feb. 2022 118-127*

Control engineering computing

Redefining Monitoring Rules for Intelligent Fault Detection and Classification via CNN Transfer Learning for Smart Manufacturing. *Chien, C.*, +, *TSM May 2022 158-165*

Convolutional neural networks

An Improved Capsule Network (WaferCaps) for Wafer Bin Map Classification Based on DCGAN Data Upsampling. *Abu Ebayyeh, A.A.R.M.*, +, *TSM Feb. 2022 50-59*

DeePattern: Layout Pattern Generation With Transforming Convolutional Auto-Encoder. Yang, H., +, TSM Feb. 2022 67-77

Efficient and Refined Deep Convolutional Features Network for the Crack Segmentation of Solar Cell Electroluminescence Images. *Wang, C.*, +, *TSM Nov. 2022 610-619*

Guest Editorial Process-Level Machine Learning Applications in Semiconductor Manufacturing. Susto, G.A., +, TSM May 2022 155-157

Image-Based Defect Classification for TFT-LCD Array via Convolutional Neural Network. Chien, C., +, TSM Nov. 2022 650-657

Mixed-Type Wafer Defect Recognition With Multi-Scale Information Fusion Transformer. Wei, Y., +, TSM May 2022 341-352

Redefining Monitoring Rules for Intelligent Fault Detection and Classification via CNN Transfer Learning for Smart Manufacturing. *Chien, C.*, +, *TSM May 2022 158-165*

Temporal Convolution-Based Long-Short Term Memory Network With Attention Mechanism for Remaining Useful Life Prediction. *Hsu, C.*, +, *TSM May 2022 220-228*

Cooling

A Comparative Study on Velocity Fields, Humidity and Oxygen Concentration in a Front Opening Unified Pod (FOUP) During Purge. *Lin, T., +, TSM Feb. 2022 110-117*

Copper

Source Pad Design Tradeoffs for a Power TrenchFET. Williams, B., +, TSM Aug. 2022 439-445

Costs

Multiobjective Order Promising for Outsourcing Supply Network of IC Design Houses. Chen, J.C., +, TSM Nov. 2022 680-697

Crystal defects

Automatic Defect Detection in Epitaxial Layers by Micro Photoluminescence Imaging. Frascaroli, J., +, TSM Aug. 2022 540-545

One Class Process Anomaly Detection Using Kernel Density Estimation Methods. *Lang, C.I.*, +, *TSM Aug. 2022 457-469*

Semiconductor Defect Pattern Classification by Self-Proliferation-and-Attention Neural Network. *Yang, Y., +, TSM Feb. 2022 16-23*

Crystal growth

Data-Driven and Mechanism-Based Hybrid Model for Semiconductor Silicon Monocrystalline Quality Prediction in the Czochralski Process. Ren, J., +, TSM Nov. 2022 658-669

Crystals

Data-Driven and Mechanism-Based Hybrid Model for Semiconductor Silicon Monocrystalline Quality Prediction in the Czochralski Process. *Ren*, *J.*, +, *TSM Nov. 2022 658-669*

Nitrogen-Doped Czochralski Silicon Wafers as Materials for Conventional and Scaled Insulated Gate Bipolar Transistors. *Kajiwara, K.*, +, *TSM Nov.* 2022 620-625

Current density

Edge Effects of an Eddy-Current Thickness Sensor During Chemical Mechanical Polishing. Wang, C., +, TSM Feb. 2022 24-31

Customer services

Customer Order Behavior Classification Via Convolutional Neural Networks in the Semiconductor Industry. *Ratusny*, M., +, TSM Aug. 2022 470-477

D

Data analysis

Data Visualization of Anomaly Detection in Semiconductor Processing Tools. Fan, S.S., +, TSM May 2022 186-197

Machine Learning-Based Process-Level Fault Detection and Part-Level Fault Classification in Semiconductor Etch Equipment. *Kim, S.H.*, +, *TSM May 2022 174-185*

Data handling

One Class Process Anomaly Detection Using Kernel Density Estimation Methods. *Lang, C.I.*, +, *TSM Aug. 2022 457-469*

Data mining

A One-Shot Learning Approach for Similarity Retrieval of Wafer Bin Maps With Unknown Failure Pattern. *Kong, Y., +, TSM Feb. 2022 40-49*

Customer Order Behavior Classification Via Convolutional Neural Networks in the Semiconductor Industry. *Ratusny*, M., +, TSM Aug. 2022 470-477

Data models

Data-Driven and Mechanism-Based Hybrid Model for Semiconductor Silicon Monocrystalline Quality Prediction in the Czochralski Process. *Ren*, *J.*, +, *TSM Nov. 2022 658-669*

Data visualization

Customer Order Behavior Classification Via Convolutional Neural Networks in the Semiconductor Industry. *Ratusny*, M., +, TSM Aug. 2022 470-477

Data Visualization and Fault Detection Using Bi-Kernel t-Distributed Stochastic Neighbor Embedding in Semiconductor Etching Processes. *Zhang*, H., +, TSM Aug. 2022 522-531

Data Visualization of Anomaly Detection in Semiconductor Processing Tools. Fan, S.S., +, TSM May 2022 186-197

Decision making

A Practical Approach for Managing End-of-Life Systems in Semiconductor Manufacturing Using Health Index. *Patil, D.*, +, *TSM Aug. 2022 569-579* Change Qualification Framework in Semiconductor Manufacturing. *Dass, S.N.*, +, *TSM Feb. 2022 87-101*

Streamlining Semiconductor Manufacturing of 200 mm and 300 mm Wafers: A Longitudinal Case Study on the Lot-to-Order-Matching Process. *Flechsig, C.*, +, *TSM Aug. 2022 397-404*

Decoding

Efficient and Refined Deep Convolutional Features Network for the Crack Segmentation of Solar Cell Electroluminescence Images. *Wang, C.*, +, *TSM Nov. 2022 610-619*

Deep learning

Efficient and Refined Deep Convolutional Features Network for the Crack Segmentation of Solar Cell Electroluminescence Images. *Wang, C.*, +, *TSM Nov. 2022 610-619*

Temporal Convolution-Based Long-Short Term Memory Network With Attention Mechanism for Remaining Useful Life Prediction. *Hsu, C.*, +, *TSM May 2022 220-228*

Delamination

An Investigation of Edge Bead Removal Width Variability, Effects and Process Control in Photolithographic Manufacturing. *Reiter, T.*, +, *TSM Feb.* 2022 60-66

Design for manufacture

DeePattern: Layout Pattern Generation With Transforming Convolutional Auto-Encoder. Yang, H., +, TSM Feb. 2022 67-77

Design of experiments

High Accuracy Simulation of Silicon Oxynitride Film Grown by Plasma Enhanced Chemical Vapor Deposition. Shao, H., +, TSM May 2022 309-317

Dielectric liquids

Electrical Measurements to Detect Liquid Concentration. Yeh, C., +, TSM Feb. 2022 11-15

Diffraction gratings

Shape and Roughness Extraction of Line Gratings by Small Angle X-Ray Scattering: Statistics and Simulations. *Reche, J.*, +, *TSM Aug. 2022 425-431*

Diffusion

Feature Selection for Waiting Time Predictions in Semiconductor Wafer Fabs. Schelthoff, K., +, TSM Aug. 2022 546-555

Discrete event systems

EveSyncIAI: Event Synchronization Industrial Augmented Intelligence for Fault Diagnosis. Cohen, J., +, TSM Aug. 2022 446-456

Dosimetry

Intelligent Optimization of Dosing Uniformity in Ion Implantation Systems. Lang, C.I., +, TSM Aug. 2022 580-584

DRAM chips

Integrated Test Pattern Extraction and Generation for Accurate Lithography Modeling. Cho, G., +, TSM Aug. 2022 495-503

Drying

The Effect of Purge Flow Rate and Wafer Arrangement on Humidity Invasion Into a Loaded Front Opening Unified Pod (FOUP). *Lin, T.*, +, *TSM May* 2022 353-362

Dye-sensitized solar cells

Optimization and Application of TiO₂ Hollow Microsphere Modified Scattering Layer for the Photovoltaic Conversion Efficiency of Dye-Sensitized Solar Cell. *Chou*, *J.*, +, *TSM May 2022 363-371*

 \mathbf{E}

Ecology

Fuzzy Selection Model for Quality-Based IC Packaging Process Outsourcers. Chen, K.S., +, TSM Feb. 2022 102-109

Eddy currents

Edge Effects of an Eddy-Current Thickness Sensor During Chemical Mechanical Polishing. Wang, C., +, TSM Feb. 2022 24-31

Edge detection

An Investigation of Edge Bead Removal Width Variability, Effects and Process Control in Photolithographic Manufacturing. *Reiter*; *T.*, +, *TSM Feb.* 2022 60-66

Electric current measurement

Edge Effects of an Eddy-Current Thickness Sensor During Chemical Mechanical Polishing. Wang, C., +, TSM Feb. 2022 24-31

Electric field measurement

Nondestructive Detection of Buried and Latent Defects by Negative Mode E-Beam Inspection. *Buengener, R., +, TSM Aug. 2022 405-411*

Electric sensing devices

Edge Effects of an Eddy-Current Thickness Sensor During Chemical Mechanical Polishing. Wang, C., +, TSM Feb. 2022 24-31

Nondestructive Detection of Buried and Latent Defects by Negative Mode E-Beam Inspection. *Buengener, R.*, +, *TSM Aug. 2022 405-411*

Electrical engineering computing

E-Test Validation of Space Error Budget and Metrology. Schelcher, G., +, TSM Aug. 2022 478-484

Electrochemical electrodes

Optimization and Application of TiO₂ Hollow Microsphere Modified Scattering Layer for the Photovoltaic Conversion Efficiency of Dye-Sensitized Solar Cell. *Chou, J.*, +, *TSM May 2022 363-371*

Electroluminescence

Efficient and Refined Deep Convolutional Features Network for the Crack Segmentation of Solar Cell Electroluminescence Images. *Wang, C.*, +, *TSM Nov. 2022 610-619*

Electron beam applications

Nondestructive Detection of Buried and Latent Defects by Negative Mode E-Beam Inspection. *Buengener, R.*, +, *TSM Aug. 2022 405-411*

Electronic engineering computing

Semiconductor Defect Pattern Classification by Self-Proliferation-and-Attention Neural Network. *Yang, Y.*, +, *TSM Feb. 2022 16-23*

TestDNA-E: Wafer Defect Signature for Pattern Recognition by Ensemble Learning. Li, K.S., +, TSM May 2022 372-374

Wafer Defect Pattern Labeling and Recognition Using Semi-Supervised Learning. *Li*, *K.S.*, +, *TSM May 2022 291-299*

Electronics industry

Fuzzy Selection Model for Quality-Based IC Packaging Process Outsourcers. Chen, K.S., +, TSM Feb. 2022 102-109

Elemental semiconductors

Automatic Defect Detection in Epitaxial Layers by Micro Photoluminescence Imaging. Frascaroli, J., +, TSM Aug. 2022 540-545

Edge Effects of an Eddy-Current Thickness Sensor During Chemical Mechanical Polishing. Wang, C., +, TSM Feb. 2022 24-31

Perspectives on Black Silicon in Semiconductor Manufacturing: Experimental Comparison of Plasma Etching, MACE, and Fs-Laser Etching. *Liu*, *X*., +, *TSM Aug. 2022 504-510*

Virtual Metrology for Etch Profile in Silicon Trench Etching With SF₆/O₂/Ar Plasma. *Choi*, *J.E.*, +, *TSM Feb. 2022 128-136*

Ellipsometry

On the Fly Ellipsometry Imaging for Process Deviation Detection. *Alcaire*, *T.*, +, *TSM Aug.* 2022 432-438

Energy consumption

A Comparative Study on Velocity Fields, Humidity and Oxygen Concentration in a Front Opening Unified Pod (FOUP) During Purge. *Lin, T., +, TSM Feb. 2022 110-117*

Entropy

A Hierarchical Spatial-Test Attention Network for Explainable Multiple Wafer Bin Maps Classification. Do, H., +, TSM Feb. 2022 78-86

Error analysis

E-Test Validation of Space Error Budget and Metrology. Schelcher, G., +, TSM Aug. 2022 478-484

Error correction

A Novel Automatic Probe-to-Pad Alignment Error Correction Approach. Zhong, B., +, TSM Feb. 2022 146-148

Etching

Data Visualization and Fault Detection Using Bi-Kernel t-Distributed Stochastic Neighbor Embedding in Semiconductor Etching Processes. *Zhang*, H., +, TSM Aug. 2022 522-531

Development of SiGe Indentation Process Control for Gate-All-Around FET Technology Enablement. *Schmidt, D., +, TSM Aug. 2022 412-417*

Improving Liquid Film Thickness Uniformity of Semiconductor Etching Equipment Using Flow Field Visualization and CFD Simulation. *Lin, T.,* +, *TSM May 2022 332-340*

Machine Learning-Based Process-Level Fault Detection and Part-Level Fault Classification in Semiconductor Etch Equipment. *Kim, S.H.*, +, *TSM May 2022 174-185*

Perspectives on Black Silicon in Semiconductor Manufacturing: Experimental Comparison of Plasma Etching, MACE, and Fs-Laser Etching. *Liu*, *X*., +, *TSM Aug*. 2022 504-510

Study on the Transformation of Si Trench Profile With Low Pressure of SF₆/O₂ Containing Plasmas. *Zhang, W.*, +, *TSM Nov. 2022 605-609*

F

Fabrication

Commonality Analysis for Detecting Failures Caused by Inspection Tools in Semiconductor Manufacturing Processes. An, D.W., +, TSM Nov. 2022 596-604

Failure analysis

E-Test Validation of Space Error Budget and Metrology. Schelcher, G., +, TSM Aug. 2022 478-484

Fault detection

Guest Editorial Process-Level Machine Learning Applications in Semiconductor Manufacturing. Susto, G.A., +, TSM May 2022 155-157

Fault diagnosis

ℓ₁ Trend Filtering-Based Change Point Detection for Pumping Line Balance of Deposition Equipment. Ahn, J., +, TSM Feb. 2022 137-145

An Autoencoder-Based Approach for Fault Detection in Multi-Stage Manufacturing: A Sputter Deposition and Rapid Thermal Processing Case Study. Jebril, H.T.T., +, TSM May 2022 166-173

Data Visualization and Fault Detection Using Bi-Kernel t-Distributed Stochastic Neighbor Embedding in Semiconductor Etching Processes. *Zhang*, H., +, TSM Aug. 2022 522-531

EveSyncIAI: Event Synchronization Industrial Augmented Intelligence for Fault Diagnosis. Cohen, J., +, TSM Aug. 2022 446-456

Machine Learning-Based Process-Level Fault Detection and Part-Level Fault Classification in Semiconductor Etch Equipment. *Kim, S.H.*, +, *TSM May 2022 174-185*

One Class Process Anomaly Detection Using Kernel Density Estimation Methods. Lang, C.I., +, TSM Aug. 2022 457-469

Optimal Feature Selection for Defect Classification in Semiconductor Wafers. Gomez-Sirvent, J.L., +, TSM May 2022 324-331

Redefining Monitoring Rules for Intelligent Fault Detection and Classification via CNN Transfer Learning for Smart Manufacturing. *Chien, C.*, +, *TSM May 2022 158-165*

TestDNA-E: Wafer Defect Signature for Pattern Recognition by Ensemble Learning. *Li*, *K.S.*, +, *TSM May 2022 372-374*

Feature extraction

An Autoencoder-Based Approach for Fault Detection in Multi-Stage Manufacturing: A Sputter Deposition and Rapid Thermal Processing Case Study. Jebril, H.T.T., +, TSM May 2022 166-173

An Improved Capsule Network (WaferCaps) for Wafer Bin Map Classification Based on DCGAN Data Upsampling. *Abu Ebayyeh*, A.A.R.M., +, TSM Feb. 2022 50-59

Efficient and Refined Deep Convolutional Features Network for the Crack Segmentation of Solar Cell Electroluminescence Images. *Wang, C.*, +, *TSM Nov. 2022 610-619*

EveSyncIAI: Event Synchronization Industrial Augmented Intelligence for Fault Diagnosis. *Cohen, J.*, +, *TSM Aug. 2022 446-456*

Feature Selection for Waiting Time Predictions in Semiconductor Wafer Fabs. Schelthoff, K., +, TSM Aug. 2022 546-555

Image-Based Defect Classification for TFT-LCD Array via Convolutional Neural Network. Chien, C., +, TSM Nov. 2022 650-657

Mixed-Type Wafer Defect Recognition With Multi-Scale Information Fusion Transformer. Wei, Y., +, TSM May 2022 341-352

Temporal Convolution-Based Long-Short Term Memory Network With Attention Mechanism for Remaining Useful Life Prediction. *Hsu, C.*, +, *TSM May 2022 220-228*

Wafer Scratch Pattern Reconstruction for High Diagnosis Accuracy and Yield Optimization. Li, K.S., +, TSM May 2022 272-281

Feature selection

Optimal Feature Selection for Defect Classification in Semiconductor Wafers. Gomez-Sirvent, J.L., +, TSM May 2022 324-331

Field emission scanning electron microscopy

Optimization and Application of TiO₂ Hollow Microsphere Modified Scattering Layer for the Photovoltaic Conversion Efficiency of Dye-Sensitized Solar Cell. *Chou, J.*, +, *TSM May 2022 363-371*

Finite element analysis

An Advanced Finite Element Model for BiCMOS Process Oriented Ultra-Thin Wafer Deformation. Cao, Z., +, TSM Feb. 2022 2-10

Flaw detectio

Wafer Scratch Pattern Reconstruction for High Diagnosis Accuracy and Yield Optimization. Li, K.S., +, TSM May 2022 272-281

Flow visualization

A Comparative Study on Velocity Fields, Humidity and Oxygen Concentration in a Front Opening Unified Pod (FOUP) During Purge. *Lin*, *T*., +, *TSM Feb.* 2022 110-117

Improving Liquid Film Thickness Uniformity of Semiconductor Etching Equipment Using Flow Field Visualization and CFD Simulation. *Lin, T.,* +, *TSM May 2022 332-340*

The Effect of Purge Flow Rate and Wafer Arrangement on Humidity Invasion Into a Loaded Front Opening Unified Pod (FOUP). *Lin, T.*, +, *TSM May 2022 353-362*

Foundries

Fuzzy Selection Model for Quality-Based IC Packaging Process Outsourcers. Chen, K.S., +, TSM Feb. 2022 102-109

Furnaces

Data-Driven and Mechanism-Based Hybrid Model for Semiconductor Silicon Monocrystalline Quality Prediction in the Czochralski Process. *Ren, J., +, TSM Nov. 2022 658-669*

Fuzzy set theory

Fuzzy Selection Model for Quality-Based IC Packaging Process Outsourcers. Chen, K.S., +, TSM Feb. 2022 102-109

G

Gallium arsenide

Study on Mechanical Cleavage Mechanism of GaAs via Anisotropic Stress Field and Experiments. *Gao, R.*, +, *TSM Nov. 2022 633-640*

Gaussian processes

Modeling and Optimizing the Impact of Process and Equipment Parameters in Sputtering Deposition Systems Using a Gaussian Process Machine Learning Framework. *Lang, C.I.*, +, *TSM May 2022 229-240*

One Class Process Anomaly Detection Using Kernel Density Estimation Methods. *Lang, C.I., +, TSM Aug. 2022 457-469*

Ge-Si alloys

An Advanced Finite Element Model for BiCMOS Process Oriented Ultra-Thin Wafer Deformation. Cao, Z., +, TSM Feb. 2022 2-10

Development of SiGe Indentation Process Control for Gate-All-Around FET Technology Enablement. Schmidt, D., +, TSM Aug. 2022 412-417

Geometry

DeePattern: Layout Pattern Generation With Transforming Convolutional Auto-Encoder. Yang, H., +, TSM Feb. 2022 67-77

Greedy algorithms

Wafer Lot Assignment for Parallel-Producing Tools Based on Heuristic Clustering Algorithm. *Zhang, F.*, +, *TSM May 2022 300-308*

Grinding

An Advanced Finite Element Model for BiCMOS Process Oriented Ultra-Thin Wafer Deformation. Cao, Z., +, TSM Feb. 2022 2-10

H

Heat transfer

Investigations of Fast Vacuum Pump-Down Processes Between Parallel Isothermal Disks. Yu, D., +, TSM Aug. 2022 556-568

Heuristic algorithms

Multiobjective Order Promising for Outsourcing Supply Network of IC Design Houses. Chen, J.C., +, TSM Nov. 2022 680-697

Heuristic programming

Streamlining Semiconductor Manufacturing of 200 mm and 300 mm Wafers: A Longitudinal Case Study on the Lot-to-Order-Matching Process. *Flechsig, C.*, +, *TSM Aug. 2022 397-404*

High-speed optical techniques

Preparation and Application of Sol-Gel Polishing Pad for Polishing CVD Single Crystal Diamond at High Speed. Lu, J., +, TSM May 2022 318-323

History

Commonality Analysis for Detecting Failures Caused by Inspection Tools in Semiconductor Manufacturing Processes. An, D.W., +, TSM Nov. 2022 596-604

Hoists

Practical Q-Learning-Based Route-Guidance and Vehicle Assignment for OHT Systems in Semiconductor Fabs. *Hong, S.*, +, *TSM Aug. 2022 385-396*

Hough transforms

An Investigation of Edge Bead Removal Width Variability, Effects and Process Control in Photolithographic Manufacturing. *Reiter, T.*, +, *TSM Feb.* 2022 60-66

Wafer Scratch Pattern Reconstruction for High Diagnosis Accuracy and Yield Optimization. Li, K.S., +, TSM May 2022 272-281

Humidity

A Comparative Study on Velocity Fields, Humidity and Oxygen Concentration in a Front Opening Unified Pod (FOUP) During Purge. *Lin*, *T.*, +, *TSM Feb. 2022 110-117*

A Numerical Study on the Effects of Purge and Air Curtain Flow Rates on Humidity Invasion Into a Front Opening Unified Pod (FOUP). *Benalcazar*, D., +, TSM Nov. 2022 670-679

The Effect of Purge Flow Rate and Wafer Arrangement on Humidity Invasion Into a Loaded Front Opening Unified Pod (FOUP). *Lin, T.*, +, *TSM May 2022 353-362*

Humidity measurement

A Comparative Study on Velocity Fields, Humidity and Oxygen Concentration in a Front Opening Unified Pod (FOUP) During Purge. *Lin*, *T*, +, *TSM Feb.* 2022 110-117

I

Image classification

An Improved Capsule Network (WaferCaps) for Wafer Bin Map Classification Based on DCGAN Data Upsampling. Abu Ebayyeh, A.A.R.M., +, TSM Feb. 2022 50-59

Customer Order Behavior Classification Via Convolutional Neural Networks in the Semiconductor Industry. *Ratusny, M.*, +, *TSM Aug. 2022 470-477*

Image-Based Defect Classification for TFT-LCD Array via Convolutional Neural Network. *Chien, C.*, +, *TSM Nov. 2022 650-657*

Mixed-Type Wafer Defect Recognition With Multi-Scale Information Fusion Transformer. Wei, Y., +, TSM May 2022 341-352

Optimal Feature Selection for Defect Classification in Semiconductor Wafers. Gomez-Sirvent, J.L., +, TSM May 2022 324-331

Image color analysis

Improved Color Defect Detection With Machine Learning for After Develop Inspections in Lithography. McLaughlin, M.P., +, TSM Aug. 2022 418-424

Image enhancement

Development of SiGe Indentation Process Control for Gate-All-Around FET Technology Enablement. *Schmidt, D.*, +, *TSM Aug. 2022 412-417*

Improved Color Defect Detection With Machine Learning for After Develop Inspections in Lithography. *McLaughlin, M.P.*, +, *TSM Aug. 2022 418-424*

Image fusion

Mixed-Type Wafer Defect Recognition With Multi-Scale Information Fusion Transformer. Wei, Y., +, TSM May 2022 341-352

Image matching

Precise Pattern Alignment for Die-to-Database Inspection Based on the Generative Adversarial Network. *Nam, Y., +, TSM Aug. 2022 532-539*

Image recognition

Shear Force Classification Before Wire Bonding Based on Probe Mark 2-D Images Using Machine Learning Methods. *Wang, C.*, +, *TSM May 2022 210-219*

Wafer Scratch Pattern Reconstruction for High Diagnosis Accuracy and Yield Optimization. Li, K.S., +, TSM May 2022 272-281

Image reconstruction

Wafer Scratch Pattern Reconstruction for High Diagnosis Accuracy and Yield Optimization. Li, K.S., +, TSM May 2022 272-281

Image representation

Customer Order Behavior Classification Via Convolutional Neural Networks in the Semiconductor Industry. *Ratusny*, M., +, TSM Aug. 2022 470-477

Image resolution

Integrated Test Pattern Extraction and Generation for Accurate Lithography Modeling. Cho, G., +, TSM Aug. 2022 495-503

Image segmentation

Efficient and Refined Deep Convolutional Features Network for the Crack Segmentation of Solar Cell Electroluminescence Images. *Wang, C.*, +, *TSM Nov. 2022 610-619*

Image texture

Optimal Feature Selection for Defect Classification in Semiconductor Wafers. Gomez-Sirvent, J.L., +, TSM May 2022 324-331

Immersion lithography

Integrated Test Pattern Extraction and Generation for Accurate Lithography Modeling. Cho, G., +, TSM Aug. 2022 495-503

Indentation

Development of SiGe Indentation Process Control for Gate-All-Around FET Technology Enablement. *Schmidt, D., +, TSM Aug. 2022 412-417*

Industrial economics

Fuzzy Selection Model for Quality-Based IC Packaging Process Outsourcers. Chen, K.S., +, TSM Feb. 2022 102-109

Infrared spectra

Virtual Metrology for Etch Profile in Silicon Trench Etching With SF₆/O₂/Ar Plasma. *Choi*, *J.E.*, +, *TSM Feb. 2022 128-136*

Inspection

An Investigation of Edge Bead Removal Width Variability, Effects and Process Control in Photolithographic Manufacturing. *Reiter, T.*, +, *TSM Feb.* 2022 60-66

Automatic Defect Detection in Epitaxial Layers by Micro Photoluminescence Imaging. Frascaroli, J., +, TSM Aug. 2022 540-545

Commonality Analysis for Detecting Failures Caused by Inspection Tools in Semiconductor Manufacturing Processes. An, D.W., +, TSM Nov. 2022 596-604

Nondestructive Detection of Buried and Latent Defects by Negative Mode E-Beam Inspection. *Buengener, R., +, TSM Aug. 2022 405-411*

On the Fly Ellipsometry Imaging for Process Deviation Detection. *Alcaire*, *T.*, +, *TSM Aug. 2022 432-438*

Precise Pattern Alignment for Die-to-Database Inspection Based on the Generative Adversarial Network. Nam, Y., +, TSM Aug. 2022 532-539

Semiconductor Defect Pattern Classification by Self-Proliferation-and-Attention Neural Network. Yang, Y., +, TSM Feb. 2022 16-23

Insulated gate bipolar transistors

Nitrogen-Doped Czochralski Silicon Wafers as Materials for Conventional and Scaled Insulated Gate Bipolar Transistors. *Kajiwara, K.*, +, *TSM Nov.* 2022 620-625

Integrated circuit interconnections

E-Test Validation of Space Error Budget and Metrology. *Schelcher, G.*, +, *TSM Aug. 2022 478-484*

Integrated circuit layout

DeePattern: Layout Pattern Generation With Transforming Convolutional Auto-Encoder. Yang, H., +, TSM Feb. 2022 67-77

Integrated circuit manufacture

A Comparative Study on Velocity Fields, Humidity and Oxygen Concentration in a Front Opening Unified Pod (FOUP) During Purge. *Lin*, *T*., +, *TSM Feb. 2022 110-117*

An Advanced Finite Element Model for BiCMOS Process Oriented Ultra-Thin Wafer Deformation. Cao, Z., +, TSM Feb. 2022 2-10

Feature Selection for Waiting Time Predictions in Semiconductor Wafer Fabs. Schelthoff, K., +, TSM Aug. 2022 546-555

Mixed-Type Wafer Defect Recognition With Multi-Scale Information Fusion Transformer. Wei, Y., +, TSM May 2022 341-352

On the Fly Ellipsometry Imaging for Process Deviation Detection. *Alcaire*, *T*, +, *TSM Aug*. 2022 432-438

Practical Q-Learning-Based Route-Guidance and Vehicle Assignment for OHT Systems in Semiconductor Fabs. *Hong, S.*, +, *TSM Aug. 2022 385-396*

Semiconductor Defect Pattern Classification by Self-Proliferation-and-Attention Neural Network. *Yang, Y.*, +, *TSM Feb. 2022 16-23*

Streamlining Semiconductor Manufacturing of 200 mm and 300 mm Wafers: A Longitudinal Case Study on the Lot-to-Order-Matching Process. *Flechsig, C.*, +, *TSM Aug. 2022 397-404*

The Effect of Purge Flow Rate and Wafer Arrangement on Humidity Invasion Into a Loaded Front Opening Unified Pod (FOUP). *Lin, T.*, +, *TSM May 2022 353-362*

Wafer Bin Map Recognition With Autoencoder-Based Data Augmentation in Semiconductor Assembly Process. Shen, P., +, TSM May 2022 198-209

Integrated circuit modeling

Multiobjective Order Promising for Outsourcing Supply Network of IC Design Houses. Chen, J.C., +, TSM Nov. 2022 680-697

Integrated circuit packaging

Fuzzy Selection Model for Quality-Based IC Packaging Process Outsourcers. Chen, K.S., +, TSM Feb. 2022 102-109

The Research on Screening Method to Reduce Chip Test Escapes by Using Multi-Correlation Analysis of Parameters. *Zhang, J.*, +, *TSM May 2022 266-271*

Integrated circuit testing

E-Test Validation of Space Error Budget and Metrology. *Schelcher, G.*, +, *TSM Aug. 2022 478-484*

The Research on Screening Method to Reduce Chip Test Escapes by Using Multi-Correlation Analysis of Parameters. *Zhang, J.*, +, *TSM May 2022 266-271*

Integrated circuit yield

An Investigation of Edge Bead Removal Width Variability, Effects and Process Control in Photolithographic Manufacturing. *Reiter*, *T.*, +, *TSM Feb.* 2022 60-66

Attention Mechanism-Based Root Cause Analysis for Semiconductor Yield Enhancement Considering the Order of Manufacturing Processes. *Lee, M.Y., +, TSM May 2022 282-290*

Improved Color Defect Detection With Machine Learning for After Develop Inspections in Lithography. *McLaughlin, M.P.*, +, *TSM Aug. 2022 418-424*

Integrated circuits

A Numerical Study on the Effects of Purge and Air Curtain Flow Rates on Humidity Invasion Into a Front Opening Unified Pod (FOUP). *Benalcazar*, D., +, TSM Nov. 2022 670-679

Intelligent manufacturing systems

Redefining Monitoring Rules for Intelligent Fault Detection and Classification via CNN Transfer Learning for Smart Manufacturing. *Chien, C.*, +, *TSM May 2022 158-165*

Internal stresses

An Advanced Finite Element Model for BiCMOS Process Oriented Ultra-Thin Wafer Deformation. Cao, Z., +, TSM Feb. 2022 2-10

Internet of Things

Semiconductor Defect Pattern Classification by Self-Proliferation-and-Attention Neural Network. *Yang, Y.*, +, *TSM Feb. 2022 16-23*

Ion implantation

Intelligent Optimization of Dosing Uniformity in Ion Implantation Systems. *Lang, C.I.*, +, *TSM Aug. 2022 580-584*

Iterative methods

A Novel Automatic Probe-to-Pad Alignment Error Correction Approach. Zhong, B., +, TSM Feb. 2022 146-148

Intelligent Optimization of Dosing Uniformity in Ion Implantation Systems. Lang, C.I., +, TSM Aug. 2022 580-584

L

Lead bonding

Fuzzy Selection Model for Quality-Based IC Packaging Process Outsourcers. Chen, K.S., +, TSM Feb. 2022 102-109

Shear Force Classification Before Wire Bonding Based on Probe Mark 2-D Images Using Machine Learning Methods. *Wang, C.*, +, *TSM May 2022 210-219*

Source Pad Design Tradeoffs for a Power TrenchFET. Williams, B., +, TSM Aug. 2022 439-445

Learning (artificial intelligence)

A Hierarchical Spatial-Test Attention Network for Explainable Multiple Wafer Bin Maps Classification. Do, H., +, TSM Feb. 2022 78-86

An Improved Capsule Network (WaferCaps) for Wafer Bin Map Classification Based on DCGAN Data Upsampling. Abu Ebayyeh, A.A.R.M., +, TSM Feb. 2022 50-59

Customer Order Behavior Classification Via Convolutional Neural Networks in the Semiconductor Industry. *Ratusny, M.*, +, *TSM Aug. 2022 470-477*

Data Visualization and Fault Detection Using Bi-Kernel t-Distributed Stochastic Neighbor Embedding in Semiconductor Etching Processes. *Zhang, H.*, +, *TSM Aug. 2022 522-531*

Data Visualization of Anomaly Detection in Semiconductor Processing Tools. Fan, S.S., +, TSM May 2022 186-197

DeePattern: Layout Pattern Generation With Transforming Convolutional Auto-Encoder. Yang, H., +, TSM Feb. 2022 67-77

Development of SiGe Indentation Process Control for Gate-All-Around FET Technology Enablement. *Schmidt, D.*, +, *TSM Aug. 2022 412-417*

EveSyncIAI: Event Synchronization Industrial Augmented Intelligence for Fault Diagnosis. Cohen, J., +, TSM Aug. 2022 446-456

Improved Color Defect Detection With Machine Learning for After Develop Inspections in Lithography. *McLaughlin, M.P.*, +, *TSM Aug. 2022 418-424* Intelligent Optimization of Dosing Uniformity in Ion Implantation Systems. *Lang, C.I.*, +, *TSM Aug. 2022 580-584*

Machine Learning-Based Process-Level Fault Detection and Part-Level Fault Classification in Semiconductor Etch Equipment. *Kim, S.H.*, +, *TSM May 2022 174-185*

Mixed-Type Wafer Defect Recognition With Multi-Scale Information Fusion Transformer. Wei, Y., +, TSM May 2022 341-352

Modeling and Optimizing the Impact of Process and Equipment Parameters in Sputtering Deposition Systems Using a Gaussian Process Machine Learning Framework. *Lang, C.I.*, +, *TSM May 2022 229-240*

One Class Process Anomaly Detection Using Kernel Density Estimation Methods. *Lang, C.I.*, +, *TSM Aug. 2022 457-469*

Shear Force Classification Before Wire Bonding Based on Probe Mark 2-D Images Using Machine Learning Methods. Wang, C., +, TSM May 2022 210-219

TestDNA-E: Wafer Defect Signature for Pattern Recognition by Ensemble Learning. Li, K.S., +, TSM May 2022 372-374

Least squares approximations

A Novel Automatic Probe-to-Pad Alignment Error Correction Approach. Zhong, B., +, TSM Feb. 2022 146-148

Lithography

E-Test Validation of Space Error Budget and Metrology. *Schelcher, G.*, +, TSM Aug. 2022 478-484

Feature Selection for Waiting Time Predictions in Semiconductor Wafer Fabs. Schelthoff, K., +, TSM Aug. 2022 546-555

Improved Color Defect Detection With Machine Learning for After Develop Inspections in Lithography. McLaughlin, M.P., +, TSM Aug. 2022 418-424

Integrated Test Pattern Extraction and Generation for Accurate Lithography Modeling. Cho, G., +, TSM Aug. 2022 495-503

Logic gates

Nitrogen-Doped Czochralski Silicon Wafers as Materials for Conventional and Scaled Insulated Gate Bipolar Transistors. *Kajiwara, K.*, +, *TSM Nov.* 2022 620-625

M

Machine learning

Guest Editorial Process-Level Machine Learning Applications in Semiconductor Manufacturing. Susto, G.A., +, TSM May 2022 155-157

Maintenance engineering

Improved Color Defect Detection With Machine Learning for After Develop Inspections in Lithography. *McLaughlin, M.P.*, +, *TSM Aug. 2022 418-424* Temporal Convolution-Based Long-Short Term Memory Network With Attention Mechanism for Remaining Useful Life Prediction. *Hsu, C.*, +, *TSM May 2022 220-228*

Manufacturing

Commonality Analysis for Detecting Failures Caused by Inspection Tools in Semiconductor Manufacturing Processes. An, D.W., +, TSM Nov. 2022 596-604

Image-Based Defect Classification for TFT-LCD Array via Convolutional Neural Network. Chien, C., +, TSM Nov. 2022 650-657

Manufacturing processes

Fuzzy Selection Model for Quality-Based IC Packaging Process Outsourcers. Chen, K.S., +, TSM Feb. 2022 102-109

Understanding and Improving Virtual Metrology Systems Using Bayesian Methods. *Lang, C.I.*, +, *TSM Aug. 2022 511-521*

Manufacturing systems

A Practical Approach for Managing End-of-Life Systems in Semiconductor Manufacturing Using Health Index. *Patil*, D., +, *TSM Aug. 2022 569-579* EveSyncIAI: Event Synchronization Industrial Augmented Intelligence for Fault Diagnosis. *Cohen*, J., +, *TSM Aug. 2022 446-456*

Masks

Precise Pattern Alignment for Die-to-Database Inspection Based on the Generative Adversarial Network. *Nam, Y.*, +, *TSM Aug. 2022 532-539*

Materials handling

Practical Q-Learning-Based Route-Guidance and Vehicle Assignment for OHT Systems in Semiconductor Fabs. *Hong, S.*, +, *TSM Aug. 2022 385-396*

Mathematical models

A Numerical Study on the Effects of Purge and Air Curtain Flow Rates on Humidity Invasion Into a Front Opening Unified Pod (FOUP). *Benalcazar*, D., +, TSM Nov. 2022 670-679

Commonality Analysis for Detecting Failures Caused by Inspection Tools in Semiconductor Manufacturing Processes. An, D.W., +, TSM Nov. 2022 596-604

Mathematical programming

Fuzzy Selection Model for Quality-Based IC Packaging Process Outsourcers. Chen, K.S., +, TSM Feb. 2022 102-109

Mechanical testing

A Hierarchical Spatial-Test Attention Network for Explainable Multiple Wafer Bin Maps Classification. Do, H., +, TSM Feb. 2022 78-86

Meetings

Guest Editorial Special Section on the 2020 and 2021 SEMI Advanced Semiconductor Manufacturing Conferences. *Patterson, O.D.*, +, *TSM Aug.* 2022 381-384

Mesh generation

Data Visualization of Anomaly Detection in Semiconductor Processing Tools. Fan, S.S., +, TSM May 2022 186-197

Metals

Interface Characteristics, Erosion Behavior, and Thermal Shock Resistance of Al–Ta Alloy Coatings Produced by Arc Spraying. *Zhao, J.R.*, +, *TSM Nov. 2022 698-705*

Metrology

Guest Editorial Process-Level Machine Learning Applications in Semiconductor Manufacturing. Susto, G.A., +, TSM May 2022 155-157

Moisture

A Numerical Study on the Effects of Purge and Air Curtain Flow Rates on Humidity Invasion Into a Front Opening Unified Pod (FOUP). *Benalcazar*, D., +, TSM Nov. 2022 670-679

The Effect of Purge Flow Rate and Wafer Arrangement on Humidity Invasion Into a Loaded Front Opening Unified Pod (FOUP). *Lin, T.*, +, *TSM May 2022 353-362*

Moisture control

The Effect of Purge Flow Rate and Wafer Arrangement on Humidity Invasion Into a Loaded Front Opening Unified Pod (FOUP). *Lin, T.*, +, *TSM May 2022 353-362*

Morphology

Study on the Transformation of Si Trench Profile With Low Pressure of SF₆/O₂ Containing Plasmas. Zhang, W., +, TSM Nov. 2022 605-609

Multilayer perceptrons

Data Visualization of Anomaly Detection in Semiconductor Processing Tools. Fan, S.S., +, TSM May 2022 186-197

Improvement of Virtual Diagnostics Performance for Plasma Density in Semiconductor Etch Equipment Using Variational Auto-Encoder. Kwon, O., +, TSM May 2022 256-265

N

NAND circuits

Nondestructive Detection of Buried and Latent Defects by Negative Mode E-Beam Inspection. *Buengener, R., +, TSM Aug. 2022 405-411*

Nanofabrication

Optimization and Application of TiO₂ Hollow Microsphere Modified Scattering Layer for the Photovoltaic Conversion Efficiency of Dye-Sensitized Solar Cell. *Chou, J.*, +, *TSM May 2022 363-371*

Nanolithography

DeePattern: Layout Pattern Generation With Transforming Convolutional Auto-Encoder. Yang, H., +, TSM Feb. 2022 67-77

Integrated Test Pattern Extraction and Generation for Accurate Lithography Modeling. Cho, G., +, TSM Aug. 2022 495-503

Nanoparticles

Optimization and Application of TiO₂ Hollow Microsphere Modified Scattering Layer for the Photovoltaic Conversion Efficiency of Dye-Sensitized Solar Cell. *Chou, J.*, +, *TSM May 2022 363-371*

Nanopatterning

Integrated Test Pattern Extraction and Generation for Accurate Lithography Modeling. Cho, G., +, TSM Aug. 2022 495-503

Nanosensors

Edge Effects of an Eddy-Current Thickness Sensor During Chemical Mechanical Polishing. Wang, C., +, TSM Feb. 2022 24-31

Neural networks

A Hierarchical Spatial-Test Attention Network for Explainable Multiple Wafer Bin Maps Classification. *Do. H.*, +, *TSM Feb. 2022 78-86*

Customer Order Behavior Classification Via Convolutional Neural Networks in the Semiconductor Industry. *Ratusny*, M., +, TSM Aug. 2022 470-477

Data Visualization of Anomaly Detection in Semiconductor Processing Tools. Fan, S.S., +, TSM May 2022 186-197

Improvement of Virtual Diagnostics Performance for Plasma Density in Semiconductor Etch Equipment Using Variational Auto-Encoder. Kwon, O., +, TSM May 2022 256-265

One Class Process Anomaly Detection Using Kernel Density Estimation Methods. Lang. C.I., +, TSM Aug. 2022 457-469

Semiconductor Defect Pattern Classification by Self-Proliferation-and-Attention Neural Network. Yang, Y., +, TSM Feb. 2022 16-23

Virtual Metrology for Etch Profile in Silicon Trench Etching With SF₆/O₂/Ar Plasma. *Choi*, *J.E.*, +, *TSM Feb. 2022 128-136*

Wafer Bin Map Recognition With Autoencoder-Based Data Augmentation in Semiconductor Assembly Process. Shen, P., +, TSM May 2022 198-209

Nitrogen

A Comparative Study on Velocity Fields, Humidity and Oxygen Concentration in a Front Opening Unified Pod (FOUP) During Purge. *Lin*, *T*., +, *TSM Feb. 2022 110-117*

Nitrogen-Doped Czochralski Silicon Wafers as Materials for Conventional and Scaled Insulated Gate Bipolar Transistors. *Kajiwara, K.*, +, *TSM Nov.* 2022 620-625

Nondestructive testing

Automatic Defect Detection in Epitaxial Layers by Micro Photoluminescence Imaging. Frascaroli, J., +, TSM Aug. 2022 540-545

Nozzles

Improving Liquid Film Thickness Uniformity of Semiconductor Etching Equipment Using Flow Field Visualization and CFD Simulation. *Lin, T.,* +, *TSM May 2022 332-340*

Numerical analysis

Investigations of Fast Vacuum Pump-Down Processes Between Parallel Isothermal Disks. Yu, D., +, TSM Aug. 2022 556-568

Numerical models

A Numerical Study on the Effects of Purge and Air Curtain Flow Rates on Humidity Invasion Into a Front Opening Unified Pod (FOUP). *Benalcazar*, D., +, TSM Nov. 2022 670-679

 \mathbf{o}

Object detection

Detection and Recognition of Mixed-Type Defect Patterns in Wafer Bin Maps via Tensor Voting. Wang, R., +, TSM Aug. 2022 485-494

Object recognition

Mixed-Type Wafer Defect Recognition With Multi-Scale Information Fusion Transformer. Wei, Y., +, TSM May 2022 341-352

Optical imaging

Image-Based Defect Classification for TFT-LCD Array via Convolutional Neural Network. Chien, C., +, TSM Nov. 2022 650-657

Optical variables measurement

On the Fly Ellipsometry Imaging for Process Deviation Detection. *Alcaire*, *T*, +, *TSM Aug*. 2022 432-438

Optimization

A Modified Lasso Model for Yield Analysis Considering the Interaction Effect in a Multistage Manufacturing Line. *Heo, T.,* +, *TSM Feb. 2022* 32-30

Dynamic Down-Selection of Measurement Markers for Optimized Robust Control of Overlay Errors in Photolithography Processes. *Zhang, H.*, +, *TSM May 2022 241-255*

Feature Selection for Waiting Time Predictions in Semiconductor Wafer Fabs. Schelthoff, K., +, TSM Aug. 2022 546-555

Intelligent Optimization of Dosing Uniformity in Ion Implantation Systems. Lang, C.I., +, TSM Aug. 2022 580-584

Modeling and Optimizing the Impact of Process and Equipment Parameters in Sputtering Deposition Systems Using a Gaussian Process Machine Learning Framework. *Lang, C.I.*, +, *TSM May 2022 229-240*

Parametric Optimization for Moisture Infiltration Prevention Into a FOUP (Front Opening Unified Pod). *Lin, T., +, TSM Feb. 2022 118-127*

Streamlining Semiconductor Manufacturing of 200 mm and 300 mm Wafers: A Longitudinal Case Study on the Lot-to-Order-Matching Process. *Flechsig, C.*, +, *TSM Aug. 2022 397-404*

Outsourcing

Fuzzy Selection Model for Quality-Based IC Packaging Process Outsourcers. Chen, K.S., +, TSM Feb. 2022 102-109

Multiobjective Order Promising for Outsourcing Supply Network of IC Design Houses. Chen, J.C., +, TSM Nov. 2022 680-697

Oxygen

A Comparative Study on Velocity Fields, Humidity and Oxygen Concentration in a Front Opening Unified Pod (FOUP) During Purge. *Lin*, *T*., +, *TSM Feb. 2022 110-117*

P

Parallel processing

Image-Based Defect Classification for TFT-LCD Array via Convolutional Neural Network. Chien, C., +, TSM Nov. 2022 650-657

Patch antennas

Fabrication of On-Silicon Aperture Coupled Patch Antenna Through Micromachining and Cu-Cu Thermocompression Bonding. *Bonam, S.*, +, *TSM Nov.* 2022 626-632

Pattern classification

A Hierarchical Spatial-Test Attention Network for Explainable Multiple Wafer Bin Maps Classification. *Do, H.*, +, *TSM Feb. 2022 78-86*

Customer Order Behavior Classification Via Convolutional Neural Networks in the Semiconductor Industry. *Ratusny*, M., +, TSM Aug. 2022 470-477

EveSyncIAI: Event Synchronization Industrial Augmented Intelligence for Fault Diagnosis. Cohen, J., +, TSM Aug. 2022 446-456

One Class Process Anomaly Detection Using Kernel Density Estimation Methods. Lang. C.I., +, TSM Aug. 2022 457-469

Redefining Monitoring Rules for Intelligent Fault Detection and Classification via CNN Transfer Learning for Smart Manufacturing. *Chien, C.*, +, *TSM May 2022 158-165*

Semiconductor Defect Pattern Classification by Self-Proliferation-and-Attention Neural Network. Yang, Y., +, TSM Feb. 2022 16-23

TestDNA-E: Wafer Defect Signature for Pattern Recognition by Ensemble Learning. *Li*, *K.S.*, +, *TSM May 2022 372-374*

Wafer Bin Map Recognition With Autoencoder-Based Data Augmentation in Semiconductor Assembly Process. *Shen, P., +, TSM May 2022 198-209* Wafer Defect Pattern Labeling and Recognition Using Semi-Supervised Learning. *Li, K.S., +, TSM May 2022 291-299*

Pattern clustering

Detection and Recognition of Mixed-Type Defect Patterns in Wafer Bin Maps via Tensor Voting. Wang, R., +, TSM Aug. 2022 485-494

Precise Pattern Alignment for Die-to-Database Inspection Based on the Generative Adversarial Network. Nam, Y., +, TSM Aug. 2022 532-539

Wafer Lot Assignment for Parallel-Producing Tools Based on Heuristic Clustering Algorithm. *Zhang, F.*, +, *TSM May 2022 300-308*

Pattern recognition

Wafer Bin Map Recognition With Autoencoder-Based Data Augmentation in Semiconductor Assembly Process. Shen, P., +, TSM May 2022 198-209

Permittivity measurement

Electrical Measurements to Detect Liquid Concentration. Yeh, C., +, TSM Feb. 2022 11-15

Petri nets

EveSyncIAI: Event Synchronization Industrial Augmented Intelligence for Fault Diagnosis. Cohen, J., +, TSM Aug. 2022 446-456

Photolithography

An Investigation of Edge Bead Removal Width Variability, Effects and Process Control in Photolithographic Manufacturing. *Reiter, T.*, +, *TSM Feb.* 2022 60-66

Dynamic Down-Selection of Measurement Markers for Optimized Robust Control of Overlay Errors in Photolithography Processes. *Zhang, H.*, +, *TSM May 2022 241-255*

Photoluminescence

Automatic Defect Detection in Epitaxial Layers by Micro Photoluminescence Imaging. Frascaroli, J., +, TSM Aug. 2022 540-545

Photoresists

An Investigation of Edge Bead Removal Width Variability, Effects and Process Control in Photolithographic Manufacturing. *Reiter, T.*, +, *TSM Feb.* 2022 60-66

Integrated Test Pattern Extraction and Generation for Accurate Lithography Modeling. Cho, G., +, TSM Aug. 2022 495-503

Photovoltaic cells

Efficient and Refined Deep Convolutional Features Network for the Crack Segmentation of Solar Cell Electroluminescence Images. *Wang, C.*, +, *TSM Nov. 2022 610-619*

Plasma CVD

High Accuracy Simulation of Silicon Oxynitride Film Grown by Plasma Enhanced Chemical Vapor Deposition. Shao, H., +, TSM May 2022 309-317

Plasma density

Improvement of Virtual Diagnostics Performance for Plasma Density in Semiconductor Etch Equipment Using Variational Auto-Encoder. Kwon, O., +, TSM May 2022 256-265

Plasma materials processing

Virtual Metrology for Etch Profile in Silicon Trench Etching With SF₆/O₂/Ar Plasma. *Choi*, *J.E.*, +, *TSM Feb. 2022 128-136*

Plasmas

Study on the Transformation of Si Trench Profile With Low Pressure of SF₆/O₂ Containing Plasmas. *Zhang, W.*, +, *TSM Nov. 2022 605-609*

Polymer fibers

Preparation and Application of Sol-Gel Polishing Pad for Polishing CVD Single Crystal Diamond at High Speed. Lu, J., +, TSM May 2022 318-323

Powders

Preparation and Application of Sol-Gel Polishing Pad for Polishing CVD Single Crystal Diamond at High Speed. Lu, J., +, TSM May 2022 318-323

Power field effect transistors

Source Pad Design Tradeoffs for a Power TrenchFET. Williams, B., +, TSM Aug. 2022 439-445

Power supplies

Study on the Transformation of Si Trench Profile With Low Pressure of SF₆/O₂ Containing Plasmas. *Zhang, W.*, +, *TSM Nov. 2022 605-609*

Predictive models

Data-Driven and Mechanism-Based Hybrid Model for Semiconductor Silicon Monocrystalline Quality Prediction in the Czochralski Process. Ren, J., +, TSM Nov. 2022 658-669

Pressure control

Study on the Transformation of Si Trench Profile With Low Pressure of SF₆/O₂ Containing Plasmas. *Zhang*, W., +, TSM Nov. 2022 605-609

Principal component analysis

Integrated Test Pattern Extraction and Generation for Accurate Lithography Modeling. Cho, G., +, TSM Aug. 2022 495-503

Shear Force Classification Before Wire Bonding Based on Probe Mark 2-D Images Using Machine Learning Methods. *Wang, C.*, +, *TSM May 2022 210-219*

Probability

A Hierarchical Spatial-Test Attention Network for Explainable Multiple Wafer Bin Maps Classification. *Do, H.*, +, *TSM Feb. 2022 78-86*

Process control

An Autoencoder-Based Approach for Fault Detection in Multi-Stage Manufacturing: A Sputter Deposition and Rapid Thermal Processing Case Study. Jebril, H.T.T., +, TSM May 2022 166-173

Commonality Analysis for Detecting Failures Caused by Inspection Tools in Semiconductor Manufacturing Processes. An, D.W., +, TSM Nov. 2022 596-604

Development of SiGe Indentation Process Control for Gate-All-Around FET Technology Enablement. *Schmidt, D., +, TSM Aug. 2022 412-417*

Dynamic Down-Selection of Measurement Markers for Optimized Robust Control of Overlay Errors in Photolithography Processes. *Zhang, H.*, +, *TSM May 2022 241-255*

Image-Based Defect Classification for TFT-LCD Array via Convolutional Neural Network. Chien, C., +, TSM Nov. 2022 650-657

Redefining Monitoring Rules for Intelligent Fault Detection and Classification via CNN Transfer Learning for Smart Manufacturing. *Chien, C.*, +, TSM May 2022 158-165

Understanding and Improving Virtual Metrology Systems Using Bayesian Methods. Lang, C.I., +, TSM Aug. 2022 511-521

Process monitoring

On the Fly Ellipsometry Imaging for Process Deviation Detection. *Alcaire*, *T.*, +, *TSM Aug. 2022 432-438*

Product quality

ℓ₁ Trend Filtering-Based Change Point Detection for Pumping Line Balance of Deposition Equipment. Ahn, J., +, TSM Feb. 2022 137-145

A Comparative Study on Velocity Fields, Humidity and Oxygen Concentration in a Front Opening Unified Pod (FOUP) During Purge. *Lin, T., +, TSM Feb. 2022 110-117*

Redefining Monitoring Rules for Intelligent Fault Detection and Classification via CNN Transfer Learning for Smart Manufacturing. *Chien, C.*, +, *TSM May 2022 158-165*

The Effect of Purge Flow Rate and Wafer Arrangement on Humidity Invasion Into a Loaded Front Opening Unified Pod (FOUP). *Lin, T.*, +, *TSM May 2022 353-362*

Production engineering computing

A Hierarchical Spatial-Test Attention Network for Explainable Multiple Wafer Bin Maps Classification. *Do, H.*, +, *TSM Feb. 2022 78-86*

A Novel Automatic Probe-to-Pad Alignment Error Correction Approach. Zhong, B., +, TSM Feb. 2022 146-148

A One-Shot Learning Approach for Similarity Retrieval of Wafer Bin Maps With Unknown Failure Pattern. *Kong, Y., +, TSM Feb. 2022 40-49*

An Improved Capsule Network (WaferCaps) for Wafer Bin Map Classification Based on DCGAN Data Upsampling. *Abu Ebayyeh, A.A.R.M.*, +, *TSM Feb. 2022 50-59*

An Investigation of Edge Bead Removal Width Variability, Effects and Process Control in Photolithographic Manufacturing. *Reiter, T.*, +, *TSM Feb.* 2022 60-66

Data Visualization and Fault Detection Using Bi-Kernel t-Distributed Stochastic Neighbor Embedding in Semiconductor Etching Processes. *Zhang,* H., +, TSM Aug. 2022 522-531

Detection and Recognition of Mixed-Type Defect Patterns in Wafer Bin Maps via Tensor Voting. Wang, R., +, TSM Aug. 2022 485-494

EveSyncIAI: Event Synchronization Industrial Augmented Intelligence for Fault Diagnosis. *Cohen, J.*, +, *TSM Aug. 2022 446-456*

Improved Color Defect Detection With Machine Learning for After Develop Inspections in Lithography. McLaughlin, M.P., +, TSM Aug. 2022 418-424

Machine Learning-Based Process-Level Fault Detection and Part-Level Fault Classification in Semiconductor Etch Equipment. *Kim, S.H.*, +, *TSM May 2022 174-185*

Mixed-Type Wafer Defect Recognition With Multi-Scale Information Fusion Transformer. Wei, Y., +, TSM May 2022 341-352

Modeling and Optimizing the Impact of Process and Equipment Parameters in Sputtering Deposition Systems Using a Gaussian Process Machine Learning Framework. *Lang. C.I.*, +, *TSM May 2022 229-240*

Optimal Feature Selection for Defect Classification in Semiconductor Wafers. Gomez-Sirvent, J.L., +, TSM May 2022 324-331

Practical Q-Learning-Based Route-Guidance and Vehicle Assignment for OHT Systems in Semiconductor Fabs. *Hong, S.*, +, *TSM Aug. 2022 385-396*

Redefining Monitoring Rules for Intelligent Fault Detection and Classification via CNN Transfer Learning for Smart Manufacturing. *Chien, C.*, +, *TSM May 2022 158-165*

Understanding and Improving Virtual Metrology Systems Using Bayesian Methods. *Lang, C.I.*, +, *TSM Aug. 2022 511-521*

Virtual Metrology for Etch Profile in Silicon Trench Etching With SF₆/O₂/Ar Plasma. *Choi*, *J.E.*, +, *TSM Feb.* 2022 128-136

Wafer Bin Map Recognition With Autoencoder-Based Data Augmentation in Semiconductor Assembly Process. *Shen, P., +, TSM May 2022 198-209* Wafer Lot Assignment for Parallel-Producing Tools Based on Heuristic Clustering Algorithm. *Zhang, F., +, TSM May 2022 300-308*

Production equipment

\$\ell_1\$ Trend Filtering-Based Change Point Detection for Pumping Line Balance of Deposition Equipment. Ahn, J., +, TSM Feb. 2022 137-145

A Modified Lasso Model for Yield Analysis Considering the Interaction Effect in a Multistage Manufacturing Line. *Heo, T.*, +, *TSM Feb. 2022 32-39*

An Autoencoder-Based Approach for Fault Detection in Multi-Stage Manufacturing: A Sputter Deposition and Rapid Thermal Processing Case Study. Jebril, H.T.T., +, TSM May 2022 166-173

Project management

Streamlining Semiconductor Manufacturing of 200 mm and 300 mm Wafers: A Longitudinal Case Study on the Lot-to-Order-Matching Process. *Flechsig, C.*, +, *TSM Aug. 2022 397-404*

Proximity effect (lithography)

DeePattern: Layout Pattern Generation With Transforming Convolutional Auto-Encoder. Yang, H., +, TSM Feb. 2022 67-77

Integrated Test Pattern Extraction and Generation for Accurate Lithography Modeling. Cho, G., +, TSM Aug. 2022 495-503

Pumps

Investigations of Fast Vacuum Pump-Down Processes Between Parallel Isothermal Disks. Yu, D., +, TSM Aug. 2022 556-568

R

Radiation therapy

Intelligent Optimization of Dosing Uniformity in Ion Implantation Systems. Lang. C.I., +, TSM Aug. 2022 580-584

Raman spectra

Preparation and Application of Sol-Gel Polishing Pad for Polishing CVD Single Crystal Diamond at High Speed. Lu, J., +, TSM May 2022 318-323

Random forests

Commonality Analysis for Detecting Failures Caused by Inspection Tools in Semiconductor Manufacturing Processes. An, D.W., +, TSM Nov. 2022 506-604

Feature Selection for Waiting Time Predictions in Semiconductor Wafer Fabs. Schelthoff, K., +, TSM Aug. 2022 546-555

Virtual Metrology for Etch Profile in Silicon Trench Etching With SF₆/O₂/Ar Plasma. *Choi, J.E.,* +, *TSM Feb. 2022 128-136*

Recurrent neural networks

Attention Mechanism-Based Root Cause Analysis for Semiconductor Yield Enhancement Considering the Order of Manufacturing Processes. *Lee, M.Y., +, TSM May 2022 282-290*

Temporal Convolution-Based Long-Short Term Memory Network With Attention Mechanism for Remaining Useful Life Prediction. *Hsu, C.*, +, *TSM May 2022 220-228*

Refractive index

On the Fly Ellipsometry Imaging for Process Deviation Detection. *Alcaire*, *T.*, +, *TSM Aug. 2022 432-438*

Regression analysis

A Modified Lasso Model for Yield Analysis Considering the Interaction Effect in a Multistage Manufacturing Line. *Heo, T.*, +, *TSM Feb. 2022 32-39*

Improvement of Virtual Diagnostics Performance for Plasma Density in Semiconductor Etch Equipment Using Variational Auto-Encoder. *Kwon, O., +, TSM May 2022 256-265*

Shear Force Classification Before Wire Bonding Based on Probe Mark 2-D Images Using Machine Learning Methods. *Wang, C.*, +, *TSM May 2022 210-219*

Temporal Convolution-Based Long-Short Term Memory Network With Attention Mechanism for Remaining Useful Life Prediction. *Hsu, C.*, +, *TSM May 2022 220-228*

Reinforcement learning

Practical Q-Learning-Based Route-Guidance and Vehicle Assignment for OHT Systems in Semiconductor Fabs. *Hong, S.*, +, *TSM Aug. 2022 385-*

Reliability

Nondestructive Detection of Buried and Latent Defects by Negative Mode E-Beam Inspection. *Buengener, R.*, +, *TSM Aug. 2022 405-411*

Shear Force Classification Before Wire Bonding Based on Probe Mark 2-D Images Using Machine Learning Methods. Wang, C., +, TSM May 2022 210-219

Remaining life assessment

Temporal Convolution-Based Long-Short Term Memory Network With Attention Mechanism for Remaining Useful Life Prediction. *Hsu, C.*, +, *TSM May 2022 220-228*

Resists

Study on the Transformation of Si Trench Profile With Low Pressure of SF₆/O₂ Containing Plasmas. *Zhang, W.*, +, *TSM Nov. 2022 605-609*

Response surface methodology

Parametric Optimization for Moisture Infiltration Prevention Into a FOUP (Front Opening Unified Pod). *Lin, T., +, TSM Feb. 2022 118-127*

Robust control

Dynamic Down-Selection of Measurement Markers for Optimized Robust Control of Overlay Errors in Photolithography Processes. *Zhang, H.*, +, *TSM May 2022 241-255*

Rough surfaces

Study on Mechanical Cleavage Mechanism of GaAs via Anisotropic Stress Field and Experiments. *Gao, R.*, +, *TSM Nov. 2022 633-640*

Study on Polishing of Polycrystalline AlN Using Sol–Gel Polishing Tool. Lu, J., +, TSM Nov. 2022 641-649

Scanning electron microscopy

High Accuracy Simulation of Silicon Oxynitride Film Grown by Plasma Enhanced Chemical Vapor Deposition. Shao, H., +, TSM May 2022 309-317

 \mathbf{S}

Optimal Feature Selection for Defect Classification in Semiconductor Wafers. Gomez-Sirvent, J.L., +, TSM May 2022 324-331

Scattering

Optimization and Application of TiO₂ Hollow Microsphere Modified Scattering Layer for the Photovoltaic Conversion Efficiency of Dye-Sensitized Solar Cell. *Chou*, *J.*, +, *TSM May 2022 363-371*

Scheduling

Wafer Lot Assignment for Parallel-Producing Tools Based on Heuristic Clustering Algorithm. Zhang, F., +, TSM May 2022 300-308

Schottky barriers

The Research on Screening Method to Reduce Chip Test Escapes by Using Multi-Correlation Analysis of Parameters. *Zhang, J.*, +, *TSM May 2022 266-271*

Schottky diodes

The Research on Screening Method to Reduce Chip Test Escapes by Using Multi-Correlation Analysis of Parameters. *Zhang, J.*, +, *TSM May 2022 266-271*

Search problems

Feature Selection for Waiting Time Predictions in Semiconductor Wafer Fabs. Schelthoff, K., +, TSM Aug. 2022 546-555

Optimal Feature Selection for Defect Classification in Semiconductor Wafers. Gomez-Sirvent, J.L., +, TSM May 2022 324-331

Wafer Lot Assignment for Parallel-Producing Tools Based on Heuristic Clustering Algorithm. Zhang, F., +, TSM May 2022 300-308

Semantics

Efficient and Refined Deep Convolutional Features Network for the Crack Segmentation of Solar Cell Electroluminescence Images. *Wang, C.*, +, *TSM Nov. 2022 610-619*

Semi-supervised learning (artificial intelligence)

Wafer Defect Pattern Labeling and Recognition Using Semi-Supervised Learning. Li, K.S., +, TSM May 2022 291-299

Semiconductor device manufacture

ℓ₁ Trend Filtering-Based Change Point Detection for Pumping Line Balance of Deposition Equipment. Ahn, J., +, TSM Feb. 2022 137-145

A Comparative Study on Velocity Fields, Humidity and Oxygen Concentration in a Front Opening Unified Pod (FOUP) During Purge. *Lin*, *T*., +, *TSM Feb. 2022 110-117*

A Hierarchical Spatial-Test Attention Network for Explainable Multiple Wafer Bin Maps Classification. *Do, H.*, +, *TSM Feb. 2022 78-86*

A One-Shot Learning Approach for Similarity Retrieval of Wafer Bin Maps With Unknown Failure Pattern. *Kong, Y.*, +, *TSM Feb. 2022 40-49*

An Improved Capsule Network (WaferCaps) for Wafer Bin Map Classification Based on DCGAN Data Upsampling. *Abu Ebayyeh*, *A.A.R.M.*, +, *TSM Feb.* 2022 50-59

An Investigation of Edge Bead Removal Width Variability, Effects and Process Control in Photolithographic Manufacturing. *Reiter, T., +, TSM Feb.* 2022 60-66

Attention Mechanism-Based Root Cause Analysis for Semiconductor Yield Enhancement Considering the Order of Manufacturing Processes. *Lee, M.Y., +, TSM May 2022 282-290*

Change Qualification Framework in Semiconductor Manufacturing. *Dass*, S.N., +, TSM Feb. 2022 87-101

Data Visualization of Anomaly Detection in Semiconductor Processing Tools. Fan, S.S., +, TSM May 2022 186-197

Detection and Recognition of Mixed-Type Defect Patterns in Wafer Bin Maps via Tensor Voting. Wang, R., +, TSM Aug. 2022 485-494

Dynamic Down-Selection of Measurement Markers for Optimized Robust Control of Overlay Errors in Photolithography Processes. *Zhang, H.*, +, *TSM May 2022 241-255*

Feature Selection for Waiting Time Predictions in Semiconductor Wafer Fabs. Schelthoff, K., +, TSM Aug. 2022 546-555

- Guest Editorial Process-Level Machine Learning Applications in Semiconductor Manufacturing. Susto, G.A., +, TSM May 2022 155-157
- Guest Editorial Special Section on the 2020 and 2021 SEMI Advanced Semiconductor Manufacturing Conferences. *Patterson, O.D.*, +, *TSM Aug.* 2022 381-384
- Improving Liquid Film Thickness Uniformity of Semiconductor Etching Equipment Using Flow Field Visualization and CFD Simulation. *Lin, T.,* +, *TSM May 2022 332-340*
- On the Fly Ellipsometry Imaging for Process Deviation Detection. *Alcaire*, *T.*, +, *TSM Aug. 2022 432-438*
- Optimal Feature Selection for Defect Classification in Semiconductor Wafers. Gomez-Sirvent, J.L., +, TSM May 2022 324-331
- Parametric Optimization for Moisture Infiltration Prevention Into a FOUP (Front Opening Unified Pod). *Lin, T., +, TSM Feb. 2022 118-127*
- Practical Q-Learning-Based Route-Guidance and Vehicle Assignment for OHT Systems in Semiconductor Fabs. *Hong, S.*, +, *TSM Aug. 2022 385-396*
- Redefining Monitoring Rules for Intelligent Fault Detection and Classification via CNN Transfer Learning for Smart Manufacturing. *Chien, C.*, +, *TSM May 2022 158-165*
- Semiconductor Defect Pattern Classification by Self-Proliferation-and-Attention Neural Network. *Yang, Y.*, +, *TSM Feb. 2022 16-23*
- Streamlining Semiconductor Manufacturing of 200 mm and 300 mm Wafers: A Longitudinal Case Study on the Lot-to-Order-Matching Process. *Flechsig, C.*, +, *TSM Aug. 2022 397-404*
- The Effect of Purge Flow Rate and Wafer Arrangement on Humidity Invasion Into a Loaded Front Opening Unified Pod (FOUP). *Lin, T.*, +, *TSM May 2022 353-362*
- Understanding and Improving Virtual Metrology Systems Using Bayesian Methods. *Lang, C.I.*, +, *TSM Aug. 2022 511-521*
- Virtual Metrology for Etch Profile in Silicon Trench Etching With SF₆/O₂/Ar Plasma. *Choi*, *J.E.*, +, *TSM Feb. 2022 128-136*
- Wafer Bin Map Recognition With Autoencoder-Based Data Augmentation in Semiconductor Assembly Process. *Shen, P., +, TSM May 2022 198-209* Wafer Lot Assignment for Parallel-Producing Tools Based on Heuristic Clustering Algorithm. *Zhang, F., +, TSM May 2022 300-308*

Semiconductor device measurement

- Interface Characteristics, Erosion Behavior, and Thermal Shock Resistance of Al–Ta Alloy Coatings Produced by Arc Spraying. Zhao, J.R., +, TSM Nov. 2022 698-705
- Nitrogen-Doped Czochralski Silicon Wafers as Materials for Conventional and Scaled Insulated Gate Bipolar Transistors. *Kajiwara, K.*, +, *TSM Nov.* 2022 620-625

Semiconductor device modeling

- Data-Driven and Mechanism-Based Hybrid Model for Semiconductor Silicon Monocrystalline Quality Prediction in the Czochralski Process. *Ren, J., +, TSM Nov. 2022 658-669*
- Multiobjective Order Promising for Outsourcing Supply Network of IC Design Houses. *Chen, J.C.*, +, *TSM Nov. 2022 680-697*

Semiconductor device models

Source Pad Design Tradeoffs for a Power TrenchFET. Williams, B., +, TSM Aug. 2022 439-445

Semiconductor device testing

- Automatic Defect Detection in Epitaxial Layers by Micro Photoluminescence Imaging. Frascaroli, J., +, TSM Aug. 2022 540-545
- TestDNA-E: Wafer Defect Signature for Pattern Recognition by Ensemble Learning. *Li*, *K.S.*, +, *TSM May 2022 372-374*

Semiconductor doping

Automatic Defect Detection in Epitaxial Layers by Micro Photoluminescence Imaging. Frascaroli, J., +, TSM Aug. 2022 540-545

Semiconductor epitaxial layers

Automatic Defect Detection in Epitaxial Layers by Micro Photoluminescence Imaging. Frascaroli, J., +, TSM Aug. 2022 540-545

Semiconductor growth

Automatic Defect Detection in Epitaxial Layers by Micro Photoluminescence Imaging. Frascaroli, J., +, TSM Aug. 2022 540-545

Semiconductor industry

- A Comparative Study on Velocity Fields, Humidity and Oxygen Concentration in a Front Opening Unified Pod (FOUP) During Purge. *Lin*, *T*., +, *TSM Feb. 2022 110-117*
- A Novel Automatic Probe-to-Pad Alignment Error Correction Approach. Zhong, B., +, TSM Feb. 2022 146-148
- A Practical Approach for Managing End-of-Life Systems in Semiconductor Manufacturing Using Health Index. Patil, D., +, TSM Aug. 2022 569-579
- Customer Order Behavior Classification Via Convolutional Neural Networks in the Semiconductor Industry. *Ratusny*, M., +, TSM Aug. 2022 470-477
- Dynamic Down-Selection of Measurement Markers for Optimized Robust Control of Overlay Errors in Photolithography Processes. *Zhang, H.*, +, *TSM May 2022 241-255*
- Feature Selection for Waiting Time Predictions in Semiconductor Wafer Fabs. Schelthoff, K., +, TSM Aug. 2022 546-555
- Fuzzy Selection Model for Quality-Based IC Packaging Process Outsourcers. Chen, K.S., +, TSM Feb. 2022 102-109
- Improved Color Defect Detection With Machine Learning for After Develop Inspections in Lithography. McLaughlin, M.P., +, TSM Aug. 2022 418-424
- Machine Learning-Based Process-Level Fault Detection and Part-Level Fault Classification in Semiconductor Etch Equipment. *Kim, S.H.*, +, *TSM May 2022 174-185*
- Modeling and Optimizing the Impact of Process and Equipment Parameters in Sputtering Deposition Systems Using a Gaussian Process Machine Learning Framework. *Lang, C.I.*, +, *TSM May 2022 229-240*
- Parametric Optimization for Moisture Infiltration Prevention Into a FOUP (Front Opening Unified Pod). *Lin, T., +, TSM Feb. 2022 118-127*
- Practical Q-Learning-Based Route-Guidance and Vehicle Assignment for OHT Systems in Semiconductor Fabs. *Hong, S.*, +, *TSM Aug. 2022 385-396*
- Precise Pattern Alignment for Die-to-Database Inspection Based on the Generative Adversarial Network. *Nam, Y., +, TSM Aug. 2022 532-539*
- Redefining Monitoring Rules for Intelligent Fault Detection and Classification via CNN Transfer Learning for Smart Manufacturing. *Chien, C.*, +, *TSM May 2022 158-165*
- The Effect of Purge Flow Rate and Wafer Arrangement on Humidity Invasion Into a Loaded Front Opening Unified Pod (FOUP). *Lin, T.*, +, *TSM May 2022 353-362*
- Understanding and Improving Virtual Metrology Systems Using Bayesian Methods. *Lang, C.I.*, +, *TSM Aug. 2022 511-521*

Semiconductor lasers

Study on Mechanical Cleavage Mechanism of GaAs via Anisotropic Stress Field and Experiments. *Gao*, R., +, *TSM Nov. 2022 633-640*

Semiconductor process modeling

Integrated Test Pattern Extraction and Generation for Accurate Lithography Modeling. Cho, G., +, TSM Aug. 2022 495-503

Semiconductor technology

- A Comparative Study on Velocity Fields, Humidity and Oxygen Concentration in a Front Opening Unified Pod (FOUP) During Purge. *Lin, T., +, TSM Feb. 2022 110-117*
- A Novel Automatic Probe-to-Pad Alignment Error Correction Approach. Zhong, B., +, TSM Feb. 2022 146-148
- An Advanced Finite Element Model for BiCMOS Process Oriented Ultra-Thin Wafer Deformation. Cao, Z., +, TSM Feb. 2022 2-10
- Change Qualification Framework in Semiconductor Manufacturing. *Dass*, S.N., +, TSM Feb. 2022 87-101
- Data Visualization and Fault Detection Using Bi-Kernel t-Distributed Stochastic Neighbor Embedding in Semiconductor Etching Processes. *Zhang,* H., +, TSM Aug. 2022 522-531
- Modeling and Optimizing the Impact of Process and Equipment Parameters in Sputtering Deposition Systems Using a Gaussian Process Machine Learning Framework. *Lang, C.I.*, +, *TSM May 2022 229-240*
- Practical Q-Learning-Based Route-Guidance and Vehicle Assignment for OHT Systems in Semiconductor Fabs. *Hong, S.*, +, *TSM Aug. 2022 385-396*

Streamlining Semiconductor Manufacturing of 200 mm and 300 mm Wafers: A Longitudinal Case Study on the Lot-to-Order-Matching Process. *Flechsig, C.*, +, *TSM Aug. 2022 397-404*

Wafer Scratch Pattern Reconstruction for High Diagnosis Accuracy and Yield Optimization. Li, K.S., +, TSM May 2022 272-281

Sensors

\$\ell_1\$ Trend Filtering-Based Change Point Detection for Pumping Line Balance of Deposition Equipment. Ahn, J., +, TSM Feb. 2022 137-145

Shear deformation

An Advanced Finite Element Model for BiCMOS Process Oriented Ultra-Thin Wafer Deformation. Cao, Z., +, TSM Feb. 2022 2-10

Short-circuit currents

Optimization and Application of TiO₂ Hollow Microsphere Modified Scattering Layer for the Photovoltaic Conversion Efficiency of Dye-Sensitized Solar Cell. *Chou*, J., +, TSM May 2022 363-371

Silicon

Automatic Defect Detection in Epitaxial Layers by Micro Photoluminescence Imaging. Frascaroli, J., +, TSM Aug. 2022 540-545

Edge Effects of an Eddy-Current Thickness Sensor During Chemical Mechanical Polishing. Wang, C., +, TSM Feb. 2022 24-31

Fabrication of On-Silicon Aperture Coupled Patch Antenna Through Micromachining and Cu-Cu Thermocompression Bonding. *Bonam, S.*, +, *TSM Nov. 2022 626-632*

Nitrogen-Doped Czochralski Silicon Wafers as Materials for Conventional and Scaled Insulated Gate Bipolar Transistors. *Kajiwara, K.*, +, *TSM Nov.* 2022 620-625

Perspectives on Black Silicon in Semiconductor Manufacturing: Experimental Comparison of Plasma Etching, MACE, and Fs-Laser Etching. *Liu*, *X*., +, *TSM Aug*. 2022 504-510

Study on the Transformation of Si Trench Profile With Low Pressure of SF₆/O₂ Containing Plasmas. *Zhang, W.*, +, *TSM Nov. 2022 605-609*

Virtual Metrology for Etch Profile in Silicon Trench Etching With SF₆/O₂/Ar Plasma. *Choi*, *J.E.*, +, *TSM Feb. 2022 128-136*

Silicon compounds

High Accuracy Simulation of Silicon Oxynitride Film Grown by Plasma Enhanced Chemical Vapor Deposition. *Shao, H.*, +, *TSM May 2022 309-317*

Preparation and Application of Sol-Gel Polishing Pad for Polishing CVD Single Crystal Diamond at High Speed. Lu, J., +, TSM May 2022 318-323

The Research on Screening Method to Reduce Chip Test Escapes by Using Multi-Correlation Analysis of Parameters. *Zhang, J.*, +, *TSM May 2022 266-271*

Singular value decomposition

A Novel Automatic Probe-to-Pad Alignment Error Correction Approach. Zhong, B., +, TSM Feb. 2022 146-148

Six sigma (quality)

Fuzzy Selection Model for Quality-Based IC Packaging Process Outsourcers. Chen, K.S., +, TSM Feb. 2022 102-109

Smoke

The Effect of Purge Flow Rate and Wafer Arrangement on Humidity Invasion Into a Loaded Front Opening Unified Pod (FOUP). *Lin, T.*, +, *TSM May 2022 353-362*

Sol-gel processing

Preparation and Application of Sol-Gel Polishing Pad for Polishing CVD Single Crystal Diamond at High Speed. Lu, J., +, TSM May 2022 318-323

Solar cells

Efficient and Refined Deep Convolutional Features Network for the Crack Segmentation of Solar Cell Electroluminescence Images. *Wang, C.*, +, *TSM Nov. 2022 610-619*

Perspectives on Black Silicon in Semiconductor Manufacturing: Experimental Comparison of Plasma Etching, MACE, and Fs-Laser Etching. *Liu*, *X*., +, *TSM Aug. 2022 504-510*

Solid-state phase transformations

Preparation and Application of Sol-Gel Polishing Pad for Polishing CVD Single Crystal Diamond at High Speed. Lu, J., +, TSM May 2022 318-323

Sorting

Efficient and Refined Deep Convolutional Features Network for the Crack Segmentation of Solar Cell Electroluminescence Images. *Wang, C.*, +, *TSM Nov. 2022 610-619*

Special issues and sections

Guest Editorial Process-Level Machine Learning Applications in Semiconductor Manufacturing. Susto, G.A., +, TSM May 2022 155-157

Guest Editorial Special Section on the 2020 and 2021 SEMI Advanced Semiconductor Manufacturing Conferences. *Patterson, O.D.*, +, *TSM Aug.* 2022 381-384

Spraying

Improving Liquid Film Thickness Uniformity of Semiconductor Etching Equipment Using Flow Field Visualization and CFD Simulation. *Lin, T.,* +, *TSM May 2022 332-340*

Sprays

Improving Liquid Film Thickness Uniformity of Semiconductor Etching Equipment Using Flow Field Visualization and CFD Simulation. *Lin, T.,* +, *TSM May 2022 332-340*

Sputter deposition

Modeling and Optimizing the Impact of Process and Equipment Parameters in Sputtering Deposition Systems Using a Gaussian Process Machine Learning Framework. *Lang, C.I.*, +, *TSM May 2022 229-240*

Sputter etching

Improvement of Virtual Diagnostics Performance for Plasma Density in Semiconductor Etch Equipment Using Variational Auto-Encoder. Kwon, O., +, TSM May 2022 256-265

Perspectives on Black Silicon in Semiconductor Manufacturing: Experimental Comparison of Plasma Etching, MACE, and Fs-Laser Etching. *Liu, X.*, +, *TSM Aug.* 2022 504-510

Virtual Metrology for Etch Profile in Silicon Trench Etching With SF₆/O₂/Ar Plasma. *Choi*, *J.E.*, +, *TSM Feb. 2022 128-136*

Stacking faults

Automatic Defect Detection in Epitaxial Layers by Micro Photoluminescence Imaging. Frascaroli, J., +, TSM Aug. 2022 540-545

Statistical analysis

Feature Selection for Waiting Time Predictions in Semiconductor Wafer Fabs. Schelthoff, K., +, TSM Aug. 2022 546-555

One Class Process Anomaly Detection Using Kernel Density Estimation Methods. Lang. C.I., +, TSM Aug. 2022 457-469

Statistical distributions

One Class Process Anomaly Detection Using Kernel Density Estimation Methods. *Lang, C.I.*, +, *TSM Aug. 2022 457-469*

Statistical process control

An Investigation of Edge Bead Removal Width Variability, Effects and Process Control in Photolithographic Manufacturing. *Reiter, T.*, +, *TSM Feb.* 2022 60-66

One Class Process Anomaly Detection Using Kernel Density Estimation Methods. *Lang, C.I.*, +, *TSM Aug. 2022 457-469*

Statistical testing

The Research on Screening Method to Reduce Chip Test Escapes by Using Multi-Correlation Analysis of Parameters. *Zhang, J.*, +, *TSM May 2022 266-271*

Stochastic processes

Data Visualization of Anomaly Detection in Semiconductor Processing Tools. Fan, S.S., +, TSM May 2022 186-197

Wafer Bin Map Recognition With Autoencoder-Based Data Augmentation in Semiconductor Assembly Process. Shen, P., +, TSM May 2022 198-209

Strain

Study on Mechanical Cleavage Mechanism of GaAs via Anisotropic Stress Field and Experiments. *Gao, R.*, +, *TSM Nov. 2022 633-640*

Stress

Study on Mechanical Cleavage Mechanism of GaAs via Anisotropic Stress Field and Experiments. *Gao, R.*, +, *TSM Nov. 2022 633-640*

Structural rings

Nitrogen-Doped Czochralski Silicon Wafers as Materials for Conventional and Scaled Insulated Gate Bipolar Transistors. *Kajiwara, K.*, +, *TSM Nov.* 2022 620-625

Substrates

Fabrication of On-Silicon Aperture Coupled Patch Antenna Through Micromachining and Cu-Cu Thermocompression Bonding. Bonam, S., +, TSM Nov. 2022 626-632

Interface Characteristics, Erosion Behavior, and Thermal Shock Resistance of Al–Ta Alloy Coatings Produced by Arc Spraying. Zhao, J.R., +, TSM Nov. 2022 698-705

Study on Polishing of Polycrystalline AlN Using Sol–Gel Polishing Tool. Lu, J., +, TSM Nov. 2022 641-649

Supervised learning

Wafer Defect Pattern Labeling and Recognition Using Semi-Supervised Learning. Li, K.S., +, TSM May 2022 291-299

Supply chain management

A Practical Approach for Managing End-of-Life Systems in Semiconductor Manufacturing Using Health Index. *Patil*, D., +, TSM Aug. 2022 569-579

Customer Order Behavior Classification Via Convolutional Neural Networks in the Semiconductor Industry. *Ratusny, M.*, +, *TSM Aug. 2022 470-477*

Supply chains

Multiobjective Order Promising for Outsourcing Supply Network of IC Design Houses. Chen, J.C., +, TSM Nov. 2022 680-697

Multiobjective Order Promising for Outsourcing Supply Network of IC Design Houses. *Chen, J.C.*, +, *TSM Nov. 2022 680-697*

Support vector machines

Data Visualization and Fault Detection Using Bi-Kernel t-Distributed Stochastic Neighbor Embedding in Semiconductor Etching Processes. *Zhang*, H., +, TSM Aug. 2022 522-531

Machine Learning-Based Process-Level Fault Detection and Part-Level Fault Classification in Semiconductor Etch Equipment. *Kim, S.H.*, +, *TSM May 2022 174-185*

One Class Process Anomaly Detection Using Kernel Density Estimation Methods. *Lang, C.I.*, +, *TSM Aug. 2022 457-469*

Optimal Feature Selection for Defect Classification in Semiconductor Wafers. Gomez-Sirvent, J.L., +, TSM May 2022 324-331

Shear Force Classification Before Wire Bonding Based on Probe Mark 2-D Images Using Machine Learning Methods. *Wang, C.*, +, *TSM May 2022 210-219*

Surface cleaning

The Effect of Purge Flow Rate and Wafer Arrangement on Humidity Invasion Into a Loaded Front Opening Unified Pod (FOUP). *Lin, T.*, +, *TSM May 2022 353-362*

Surface contamination

A Comparative Study on Velocity Fields, Humidity and Oxygen Concentration in a Front Opening Unified Pod (FOUP) During Purge. *Lin*, *T.*, +, *TSM Feb. 2022 110-117*

Surface morphology

Interface Characteristics, Erosion Behavior, and Thermal Shock Resistance of Al–Ta Alloy Coatings Produced by Arc Spraying. Zhao, J.R., +, TSM Nov. 2022 698-705

Preparation and Application of Sol-Gel Polishing Pad for Polishing CVD Single Crystal Diamond at High Speed. Lu, J., +, TSM May 2022 318-323

Surface roughness

Preparation and Application of Sol-Gel Polishing Pad for Polishing CVD Single Crystal Diamond at High Speed. *Lu, J.*, +, *TSM May 2022 318-323* Study on Mechanical Cleavage Mechanism of GaAs via Anisotropic Stress Field and Experiments. *Gao, R.*, +, *TSM Nov. 2022 633-640*

Study on Polishing of Polycrystalline AlN Using Sol–Gel Polishing Tool. Lu, J., +, TSM Nov. 2022 641-649

Surface topography

Study on Polishing of Polycrystalline AlN Using Sol–Gel Polishing Tool. Lu, J., +, TSM Nov. 2022 641-649

Surface topography measurement

Shape and Roughness Extraction of Line Gratings by Small Angle X-Ray Scattering: Statistics and Simulations. *Reche, J.*, +, *TSM Aug. 2022 425-431*

Surface treatment

Study on Polishing of Polycrystalline AlN Using Sol-Gel Polishing Tool. Lu, J., +, TSM Nov. 2022 641-649

Т

Technology management

Change Qualification Framework in Semiconductor Manufacturing. *Dass*, S.N., +, TSM Feb. 2022 87-101

Temperature measurement

Interface Characteristics, Erosion Behavior, and Thermal Shock Resistance of Al–Ta Alloy Coatings Produced by Arc Spraying. *Zhao, J.R.*, +, *TSM Nov. 2022 698-705*

Tensors

Detection and Recognition of Mixed-Type Defect Patterns in Wafer Bin Maps via Tensor Voting. Wang, R., +, TSM Aug. 2022 485-494

Study on Mechanical Cleavage Mechanism of GaAs via Anisotropic Stress Field and Experiments. *Gao, R.*, +, *TSM Nov. 2022 633-640*

Thermal shock

Interface Characteristics, Erosion Behavior, and Thermal Shock Resistance of Al–Ta Alloy Coatings Produced by Arc Spraying. Zhao, J.R., +, TSM Nov. 2022 698-705

Investigations of Fast Vacuum Pump-Down Processes Between Parallel Isothermal Disks. Yu, D., +, TSM Aug. 2022 556-568

Thickness measurement

Edge Effects of an Eddy-Current Thickness Sensor During Chemical Mechanical Polishing. Wang, C., +, TSM Feb. 2022 24-31

On the Fly Ellipsometry Imaging for Process Deviation Detection. *Alcaire*, *T*, +, *TSM Aug*. 2022 432-438

Thin film sensors

Edge Effects of an Eddy-Current Thickness Sensor During Chemical Mechanical Polishing. Wang, C., +, TSM Feb. 2022 24-31

Thin film transistors

Image-Based Defect Classification for TFT-LCD Array via Convolutional Neural Network. *Chien, C.*, +, *TSM Nov. 2022 650-657*

Thin films

High Accuracy Simulation of Silicon Oxynitride Film Grown by Plasma Enhanced Chemical Vapor Deposition. *Shao, H.*, +, *TSM May 2022 309-317*

Optimization and Application of TiO₂ Hollow Microsphere Modified Scattering Layer for the Photovoltaic Conversion Efficiency of Dye-Sensitized Solar Cell. *Chou*, *J.*, +, *TSM May 2022 363-371*

Preparation and Application of Sol-Gel Polishing Pad for Polishing CVD Single Crystal Diamond at High Speed. Lu, J., +, TSM May 2022 318-323

Three-dimensional displays

Fabrication of On-Silicon Aperture Coupled Patch Antenna Through Micromachining and Cu-Cu Thermocompression Bonding. *Bonam, S.*, +, *TSM Nov. 2022 626-632*

Time series

One Class Process Anomaly Detection Using Kernel Density Estimation Methods. *Lang, C.I.*, +, *TSM Aug. 2022 457-469*

Titanium compounds

Optimization and Application of TiO₂ Hollow Microsphere Modified Scattering Layer for the Photovoltaic Conversion Efficiency of Dye-Sensitized Solar Cell. *Chou, J.*, +, *TSM May 2022 363-371*

Transmission electron microscopy

Development of SiGe Indentation Process Control for Gate-All-Around FET Technology Enablement. *Schmidt, D., +, TSM Aug. 2022 412-417*

Shape and Roughness Extraction of Line Gratings by Small Angle X-Ray Scattering: Statistics and Simulations. *Reche, J.*, +, *TSM Aug. 2022 425-431*

Transportation

Practical Q-Learning-Based Route-Guidance and Vehicle Assignment for OHT Systems in Semiconductor Fabs. *Hong, S.*, +, *TSM Aug. 2022 385-396*

U

Ultraviolet lithography

Integrated Test Pattern Extraction and Generation for Accurate Lithography Modeling. Cho, G., +, TSM Aug. 2022 495-503

Ultraviolet spectra

Virtual Metrology for Etch Profile in Silicon Trench Etching With SF₆/O₂/Ar Plasma. *Choi, J.E.,* +, *TSM Feb. 2022 128-136*

Unsupervised learning

A One-Shot Learning Approach for Similarity Retrieval of Wafer Bin Maps With Unknown Failure Pattern. *Kong, Y., +, TSM Feb. 2022 40-49*

Data Visualization of Anomaly Detection in Semiconductor Processing Tools. Fan, S.S., +, TSM May 2022 186-197

Redefining Monitoring Rules for Intelligent Fault Detection and Classification via CNN Transfer Learning for Smart Manufacturing. *Chien, C.*, +, *TSM May 2022 158-165*

Wafer Defect Pattern Labeling and Recognition Using Semi-Supervised Learning. Li, K.S., +, TSM May 2022 291-299

V

Vacuum pumps

Investigations of Fast Vacuum Pump-Down Processes Between Parallel Isothermal Disks. Yu, D., +, TSM Aug. 2022 556-568

Vectors

DeePattern: Layout Pattern Generation With Transforming Convolutional Auto-Encoder. Yang, H., +, TSM Feb. 2022 67-77

Vehicle dynamics

Practical Q-Learning-Based Route-Guidance and Vehicle Assignment for OHT Systems in Semiconductor Fabs. *Hong, S.*, +, *TSM Aug. 2022 385-396*

Velocimeters

A Comparative Study on Velocity Fields, Humidity and Oxygen Concentration in a Front Opening Unified Pod (FOUP) During Purge. *Lin*, *T.*,+, *TSM* Feb. 2022 110-117

Vibrations

A Comparative Study on Velocity Fields, Humidity and Oxygen Concentration in a Front Opening Unified Pod (FOUP) During Purge. *Lin*, *T*, +, *TSM Feb.* 2022 110-117

Visible spectra

Virtual Metrology for Etch Profile in Silicon Trench Etching With SF₆/O₂/Ar Plasma. *Choi*, *J.E.*, +, *TSM Feb. 2022 128-136*

Visualization

Image-Based Defect Classification for TFT-LCD Array via Convolutional Neural Network. Chien, C., +, TSM Nov. 2022 650-657

VLSI

DeePattern: Layout Pattern Generation With Transforming Convolutional Auto-Encoder. Yang, H., +, TSM Feb. 2022 67-77

Voltage measurement

Nondestructive Detection of Buried and Latent Defects by Negative Mode E-Beam Inspection. *Buengener, R., +, TSM Aug. 2022 405-411*

W

Wafer level packaging

Wafer Defect Pattern Labeling and Recognition Using Semi-Supervised Learning. Li, K.S., +, TSM May 2022 291-299

Wide band gap semiconductors

Automatic Defect Detection in Epitaxial Layers by Micro Photoluminescence Imaging. Frascaroli, J., +, TSM Aug. 2022 540-545

The Research on Screening Method to Reduce Chip Test Escapes by Using Multi-Correlation Analysis of Parameters. *Zhang, J.*, +, *TSM May 2022 266-271*

\mathbf{X}

X-ray diffraction

Optimization and Application of TiO₂ Hollow Microsphere Modified Scattering Layer for the Photovoltaic Conversion Efficiency of Dye-Sensitized Solar Cell. *Chou, J.*, +, *TSM May 2022 363-371*

X-ray fluorescence analysis

Development of SiGe Indentation Process Control for Gate-All-Around FET Technology Enablement. *Schmidt, D.*, +, *TSM Aug. 2022 412-417*

X-ray scattering

Shape and Roughness Extraction of Line Gratings by Small Angle X-Ray Scattering: Statistics and Simulations. *Reche, J.*, +, *TSM Aug. 2022 425-431*

Y

Young's modulus

Study on Mechanical Cleavage Mechanism of GaAs via Anisotropic Stress Field and Experiments. *Gao, R.*, +, *TSM Nov. 2022 633-640*