Exponent®
Engineering & Scientific Consulting

Ming Tang, Ph.D.

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Professional Profile

Dr. Tang specializes in mechanical metallurgy, with an emphasis on defect characterization, root cause analysis, and life prediction. He has 10-years research experience in metals, including aluminum, iron & steel, titanium, and nickel. He has expertise in the application of microscopy (automated SEM) techniques in various areas, particularly quantifying defects (pores and non-metallic inclusions) for a broad range of metallic materials and examining their effect on mechanical performance.

Dr. Tang has also developed a strong background in data science, using programming (python), machine learning (scikit-learn), and artificial intelligence (TensorFlow) to solve practical industrial problems.

Prior to joining Exponent, Dr. Tang worked as a Senior Research Engineer at ArcelorMittal Global R&D center, where he led multiple steelmaking projects related to defect quantification and process optimization. He managed the steel cleanliness characterization facility in support of product development, root cause analysis, and quality evaluation. He led projects on R&D fundamental steelmaking research to sustain new high-strength steel product manufacturability for automotive customers, such as using AI-driven accelerated defect analysis for energy-efficient steelmaking.

Before joining ArcelorMittal, Dr. Tang completed his graduate research at Carnegie Mellon University, in the Department of Materials Science and Engineering. His doctoral research focuses on the aluminum-silicon alloy parts produced by additive manufacturing (specifically, selective laser melting), including defect characterization (by 2D SEM and 3D CT), microstructure control, and fatigue life prediction. He was also a member of the Next Manufacturing Center (Carnegie Mellon University's research center for metal additive manufacturing).

Academic Credentials & Professional Honors

Ph.D., Materials Science and Engineering, Carnegie Mellon University, 2017

M.S., Materials Science and Engineering, Carnegie Mellon University, 2013

B.S., Materials Science and Engineering, Beihang University, 2012

Licenses and Certifications

Professional Engineer Metallurgical, California, #2053

Prior Experience

Research Engineer, ArcelorMittal, 2018-2022

Professional Affiliations

AIST

Publications

S. Yang, A. Rebmann, M. Tang, R. Moravec, D. Behrmann, M. Baird, W. Bequette, “Process monitoring using causal graphical models, with application to clogging detection in steel continuous casting,” J. Process Control, vol. 105, pp. 259-266, 2021, doi: 10.1016/j.jprocont.2021.08.006

M. Tang and P. C. Pistorius, “Fatigue Life Prediction for AlSi10Mg Parts Produced by Selective Laser Melting,” Int. J. Fatigue, vol. 125, pp. 479-490, 2019. doi: 10.1016/j.ijfatigue.2019.04.015

M. Tang and P. C. Pistorius, C. Montgomery, J. Beuth, “Build Rate Optimization for Powder Bed Fusion,” J. Mater. Eng. Perform., vol. 28, pp. 641–647, 2019. doi: 10.1007/s11665-018-3647-5

M. Tang and P. C. Pistorius, “Anisotropic Mechanical Behavior of AlSi10Mg Parts Produced by Selective Laser Melting,” JOM, vol. 69, pp. 516–522, 2017. doi: 10.1007/s11837-016-2230-5

M. Tang, P. C. Pistorius, and J.L. Beuth, “Prediction of Lack-of-fusion Porosity for Powder Bed Fusion,” Addit. Manuf., vol. 14, pp. 39-48, 2017. doi: 10.1016/j.addma.2016.12.001

M. Tang and P. C. Pistorius, “Oxide, Porosity and Fatigue performance of AlSi10Mg Parts Produced by Selective Laser Melting,” Int. J. Fatigue, vol. 94, pp. 192-201, 2017. doi: 10.1016/j.ijfatigue.2016.06.002

M. Tang, P. C. Pistorius, S. Narra, and J.L. Beuth, “Rapid Solidification: Selective Laser Melting of AlSi10Mg,” JOM, vol. 68, pp. 960-966, 2016. doi: 10.1007/s11837-015-1763-3

M. Tang, H. J. Cho, and P. C. Pistorius, “Early Gaseous Oxygen Enrichment to Enhance Magnetite Pellet Oxidation,” Metall. Mater. Trans. B, vol. 45, pp. 1304-1314, 2014. doi: 10.1007/s11663-014-0064-5

Presentations

M. Tang and P. C. Pistorius, “Fatigue Life Prediction for AlSi10Mg Parts Produced by Selective Laser Melting,” RAPID + TCT Conference, Pittsburgh, PA, May 2017.

M. Tang and P. C. Pistorius, “Anisotropic Mechanical Behavior of AlSi10Mg Parts Produced by Selective Laser Melting,” TMS, San Diego, CA, Mar 2017.

M. Tang and P. C. Pistorius, “Relationship between Porosity Size and Fatigue Life Distributions of AlSi10Mg Parts Produced by Selective Laser Melting,” MS&T, Salt Lake City, UT, 2016.

M. Tang, P. C. Pistorius, “Oxide, Porosity and Fatigue Performance of AlSi10Mg Parts Produced by Selective Laser Melting,” TMS, Nashville, TN, 2016.

M. Tang, P. C. Pistorius, and J.L. Beuth, “Geometric Model to Predict Porosity of Part Produced in Powder Bed System,” MS&T, Columbus, OH, 2015.

M. Tang and P. C. Pistorius, “Magnetite Pellet Oxidation: Effects of Water Vapor and Non-isothermal Reaction,” AISTech, Indianapolis, IN, 2014.

Peer Reviews

Additive Manufacturing

AIST Transactions (Key reviewer)

ASTM International

International Journal of FatigueJOM

Journal of Alloy and Compounds

Journal of Materials Processing Technology

Materials and Design

Materials Letters

Materials Performance and Characterization

Materials Science and Engineering A

Metallurgical and Materials Transactions B

Progress in Additive Manufacturing