

Joseph G. Tylka, Ph.D.

Principal Key Expert, Siemens Technology
jtylka.github.io

Email: joe.tylka@siemens.com
Mobile: +1 (609) 250-8271
755 College Rd. E, Princeton, NJ 08540

EDUCATION

Princeton University Doctor of Philosophy (Ph.D.) in Mechanical and Aerospace Engineering Master of Arts (M.A.) in Mechanical and Aerospace Engineering	Princeton, NJ 2012–2019
University of Maryland Bachelor of Science (B.S.) in Physics with a minor in Philosophy, <i>cum laude</i>	College Park, MD 2008–2012

EXPERIENCE

Siemens Technology <i>Principal Key Expert</i> , Architecture & Engineering of Intelligent Systems <i>Senior Key Expert</i> , Edge Computing Architectures & Applications <i>Research Scientist</i> , Technology Field: Future of Automation	Princeton, NJ 2023–present 2022–2023 2019–2022
Princeton University <i>Doctoral Candidate</i> , 3D Audio and Applied Acoustics Laboratory <i>Assistant in Instruction</i> , Department of Mechanical and Aerospace Engineering	Princeton, NJ 2012–2019 2014–2017
University of Maryland <i>Undergraduate Research Assistant</i> , Cosmic Ray Laboratory <i>Teaching Assistant</i> , Department of Physics	College Park, MD 2009–2012 Fall 2011

TECHNICAL SKILLS

Development: Python, C/C++, MATLAB, HTML/CSS/JS || Docker, Bash, Git, GitLab CI/CD, Linux, Flask, gRPC
Analytical: software architecture, signal processing, machine learning, algorithms, modeling, data analysis & visualization
Communication: customer workshops, stakeholder presentations, journal articles, conferences, technical reports, patents

SELECTED PROJECTS

Industrial Operations X Role: <i>Portfolio & Solution Architect</i> Contributions: architecture blueprints, portfolio analysis, requirements engineering, stakeholder management, customer workshops	Siemens Digital Industries 2024–present
Industrial Edge App Development for AI Vision, Audio, & LoRaWAN Role: <i>Product & Platform Architect</i> Contributions: software architecture, design, programming, testing, CI/CD pipelines, open-source clearing, documentation	Siemens Digital Industries 2022–present
Building Automation Protocol Connectivity Framework Role: <i>Lead Software Architect</i> Contributions: software architecture, stakeholder management, programming, CI/CD pipelines, developer documentation	Siemens Smart Infrastructure 2022–2023
Virtual Navigation of 3D Sound Fields Role: <i>Doctoral Candidate</i> Contributions: research questions, experimental design, algorithms, programming, machining, data collection & analysis, publications	Sony Corporation of America 2015–2019

SELECTED PUBLICATIONS

- ¹ C. Cho, S. Kelley, J. G. Tylka, M. He, N. N. Nandola, and C. D. Rahn. Improving Nonuniform Utilization of Li-Ion Pouch Cells Using Tapered Electrodes Through Calendering. In *49th Design Automation Conference (DAC)*, August 2023. V03AT03A032.
- ² T. Cui, J. Claus, J. Tylka, L. Wang, G. A. Quiros Araya, P. Eisen, and A. Oliveira Da Silva. Automated acoustic anomaly detection feature deployed on a programmable logic controller, Mar. 9, 2023. WO Patent Application WO2023033791A1.
- ³ A. Breu, J. Tylka, B. Erol, P. Gregor, and D. Trinko. System and method for automatically orienting product containers, Jan. 12, 2023. WO Patent Application WO2023282938A1.
- ⁴ J. Tylka. Adaptive tuning of physics-based digital twins, Dec. 1, 2022. WO Patent Application WO2022250669A1.
- ⁵ J. Tylka, A. Martinez Canedo, S. Srivastava, K. Goyal, and A. Breu. System and method to automatically generate and optimize recycling process plans for integration into a manufacturing design process, Mar. 10, 2022. WO Patent Application WO2022051236A1.
- ⁶ E. Y. Choueiri and J. Tylka. System and Method for Virtual Navigation of Sound Fields through Interpolation of Signals from an Array of Microphone Assemblies, June 8, 2021. US Patent 11,032,663.
- ⁷ J. Luo, M. Kang, E. Bisse, M. Veldink, D. Okunev, S. Kolb, J. G. Tylka, and A. Canedo. A Quad-Redundant PLC Architecture for Cyber-Resilient Industrial Control Systems. *IEEE Embedded Systems Letters*, page 4, 2020.
- ⁸ J. G. Tylka, B. B. Boren, and E. Y. Choueiri. A Generalized Method for Fractional-Octave Smoothing of Transfer Functions that Preserves Log-Frequency Symmetry. *The Journal of the Audio Engineering Society*, 65(3):239–245, March 2017.