

# 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

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

## EXPERIENCE

<b>Siemens Technology</b> <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
<b>Princeton University</b> <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
<b>University of Maryland</b> <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

<b>Industrial Operations X</b> Role: <i>Portfolio &amp; Solution Architect</i> Contributions: architecture blueprints, portfolio analysis, requirements engineering, stakeholder management, customer workshops	<u>Siemens Digital Industries</u> 2024–present
<b>Industrial Edge App Development for AI Vision, Audio, &amp; LoRaWAN</b> Role: <i>Product &amp; Platform Architect</i> Contributions: software architecture, design, programming, testing, CI/CD pipelines, open-source clearing, documentation	<u>Siemens Digital Industries</u> 2022–present
<b>Building Automation Protocol Connectivity Framework</b> Role: <i>Lead Software Architect</i> Contributions: software architecture, stakeholder management, programming, CI/CD pipelines, developer documentation	<u>Siemens Smart Infrastructure</u> 2022–2023
<b>Virtual Navigation of 3D Sound Fields</b> 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

- <sup>1</sup> 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.
- <sup>2</sup> 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.
- <sup>3</sup> 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.
- <sup>4</sup> J. Tylka. Adaptive tuning of physics-based digital twins, Dec. 1, 2022. WO Patent Application WO2022250669A1.
- <sup>5</sup> 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.
- <sup>6</sup> 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.
- <sup>7</sup> 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.
- <sup>8</sup> 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.