NICK WISWELL

SENIOR ALGORITHM ENGINEER

Specializing in Real-Time Control, Numerical Optimization, and Physics-Based Modeling
(408) 981-9295 | contact@nickwiswell.com

PROFILE

12 years of experience with algorithms, sensors, and software for real-time control and optimal planning. Leveraged numerical optimization methods, vector similarity and classification, and first-principles state-space representations to enable new system capabilities and drive improved outcomes for yield and throughput in a demanding manufacturing context. 14 granted patents.

EMPLOYMENT

Applied Materials – Algorithm Developer, Member of Technical Staff **2015 - Present**
CMP (Chemical-Mechanical Polishing) Process Control Group

- Developed a mathematical treatment for an open-ended robotic motion control problem, then prototyped and productionized an API for optimal control using a convex solver in C++
- Created first-principles kinematic simulations to inform physical sensor placement and product design, as well as optical simulations for internal stakeholders and customers
- Invented new methods for efficient interpretation of broadband reflectometry spectra, including clustering, dimensionality reduction, vector similarity, and parametric characterization, then developed software validation for these techniques and supported deployment to production; direct reflectometry control sales enabled by these advancements exceed $20M
- Investigated the feasibility of various new sensors to improve process outcomes, and subsequently led development of a novel acoustic emission sensor and control system, which is forecast to realize over $10M in sales by 2028
- Frequently engaged with large datasets using Polars, Pandas, HDF5 and SQL
- Contributed tooling to assist others with common data manipulation and analysis tasks

Applied Materials – Process Engineer **April 2014 - 2015**
CMP Disruptive Technology Group

- Developed algorithms for laser positional control to protect critical system components and obtain the optimal dose and distribution in a rotating reference frame

EDUCATION

Georgia Institute of Technology
M.S. Computer Science (2021 - 2024)

California Polytechnic State University, San Luis Obispo
M.S. Engineering, Concentration in **Materials Engineering** (2012-2014)
Master's Thesis: *Design and Fabrication of Electrostatically Actuated Serpentine-Hinged Nickel-Phosphorous Micromirror Devices*
B.S. Materials Engineering, Minor in Physics (2008-2012)

SELECTED PATENTS

- **Machine Vision as Input to Process Control:** Invented a novel control loop using real-time computer vision analysis. (US Patent #20200094370)
- **Synthetic Training Data Generation:** Developed a method for generating synthetic spectral data to train ML models in data-scarce environments. (US Patent #20200005139)

TOOLS

Python	**C / C++ / Cython**	**Linux**
NumPy	**SciPy**	**Docker**
Numerical Optimization	**Statistical Analysis**	**First-Principles Modeling**