

NICK WISWELL

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PROFILE

7 years of experience with algorithms and software for real-time process control systems. Experience with collection and analysis of large datasets from industrial systems to improve operational performance. Statistics and optimization background.

EMPLOYMENT

Applied Materials – Algorithm Developer

2015 - Present

CMP (Chemical-Mechanical Polishing) Process Control Group

- Invented new methods for interpretation of broadband reflectometry spectra and developed software validation for these techniques; new capabilities directly enabled over \$10M in sales
- Created software implementations of these algorithms to achieve real-time process control
- Developed complex simulations to determine optimal configuration of sensors and data collection
- Investigated the feasibility of various new sensors to improve process outcomes, and subsequently led development of a novel acoustic emission control system
- Frequently engaged with analysis of gigabyte or terabyte-scale datasets
- Delivered data visualizations and recommendations to drive organizational decisions
- Contributed to Big Data / AI initiative to facilitate distributed in-fab data warehousing and machine learning to enable real-time inference on spectral data

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

PROJECTS

- Independently designed, deployed, and administered a 300-node bare-metal cluster using IPMI + iPXE for RancherOS diskless boot, Docker Swarm for workload orchestration and custom Python/Bash tooling with Prometheus/Grafana for management

PATENTS

- | | |
|---|--------------|
| • <i>Machine Vision as Input to a CMP Process Control Algorithm</i> | #20200094370 |
| • <i>Polishing System with Capacitive Shear Sensor</i> | #20200070306 |
| • <i>Training Spectrum Generation for Machine Learning System for Spectrographic Monitoring</i> | #20200005139 |
| • <i>Polishing Fluid Additive Concentration Measurement Apparatus and Methods Related Thereto</i> | #20190275632 |
| • <i>Monitoring of Vibrations During Chemical Mechanical Polishing</i> | #20190283204 |

EDUCATION

California Polytechnic State University, San Luis Obispo

M.S. Engineering, Concentration in **Materials Engineering** (2014)

Master's Thesis: *Design and Fabrication of Electrostatically Actuated Serpentine-Hinged Nickel-Phosphorous Micromirror Devices*

B.S. Materials Engineering, Minor in Physics (2012)

TOOLS

Python
NumPy

C / Cython
SciPy

Linux
Bash

GDB
JMP