Aubrey Maltz

Nanotechnology Engineer
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Skills

Programming	python (for scientific computing/ML), MATLAB, LabVIEW, git, Excel/VBA, SQL, R, Design of Experiments
Business	CAPEX and OPEX estimation, time series forecasting, market research, engineering economics
Laboratory	Materials characterization (spectroscopy, microscopy, hardness tests), rheology, materials procurement
Communication	Technical report writing, pitch-style presentations, technical presentations, Microsoft Office, LaTeX
Engineering Design	AutoCAD, PCB Design, EagleCAD, COMSOL

Experience

DemonPore *Remote*
Volunteer Consultant (Part Time) *May 2020 - Present*

- Assisting in the development of signal processing and machine learning back-end for a novel dynamic nanopore-based COVID-19 diagnostic system using python
- Experience with time series classification; wavelet de-noising schemes

Sunnybrook Hospital and Research Institute *Toronto, Canada*
Summer Research Student *June 2019 - August 2019*

- Independently developed experiments which exhibited the generation of reactive oxygen species by porphyrin microbubble-assisted focused ultrasound, facilitating the technology's transition from preclinical to clinical testing

Harvard University - Aizenberg Lab at School of Engineering and Applied Science *Cambridge, MA*
Research Assistant *Feb. 2019 - May 2019*

- Developed a support vector-based machine learning model that used a photonic crystal's optical response to volatile analytes to predict the physical properties of analytes with up to 97% accuracy
- Developed a new analytic pipeline that facilitated the replacement of a spectrophotometer in the chemical sensor with an inexpensive USB camera, drastically reducing the cost of the proposed prototype
- Developed an analytical model for the crystal's photonic response to volatilizing analytes which validated the analytical back-end used

Harvard University- Wyss Institute for Bio-inspired Engineering *Cambridge, MA*
Research Assistant *September 2017 - April 2018*

- Designed and conducted experiments to validate the energy efficiency of novel membrane technology and to prove its value to investors
- Independently implemented analytical model to investigate the nature of failure in membranes which contributed to an article in APL Materials, a peer-reviewed materials science journal
- Improved and expanded pre-existing LabVIEW, MATLAB, and electronic hardware infrastructure to improve experimental flexibility and to provide new experimental insights

Waterloo Institute for Nanotechnology at University of Waterloo *Waterloo, Canada*
Research Assistant *January 2017 - April 2017*

- Fabricated and validated an electrodeposited piezoelectric zinc oxide tactile sensor based on hierarchical nanostructure

Whoosh Inc. *Toronto, Canada*
Special Projects Intern *May 2016 - August 2016*

- Increased company forecast accuracy by using empirical (ARIMA) forecasts of product demands using python, improving company cashflow

Education

University of Waterloo *Waterloo, Canada*
Bachelor of Applied Science in Nanotechnology Engineering, Honours Co-op, GPA: 90.8/100 *May 2020*

- **Delft University of Technology**, Delft, The Netherlands — *Exchange Semester Fall 2018, GPA: 8.6/10*

Projects

The Interdependency of Policy, People, and COVID-19

STEM Big Data Challenge Competition

- Analysed the relationship between government stringency, population movement, and the onset of new cases of COVID-19
- Implemented cross correlation-based statistical analyses to investigate potential causal relationships
- Abstract released in STEM Fellowship Journal

eProtect: Protecting Organic Electronics from Moisture

Capstone Design Project

- Designed, fabricated, and validated a multilayer polymeric nanocoating that protect organic electronics from moisture-induced degradation
- Researched market needs for waterproofing tech and converted these needs to specific quantitative requirements which were used to facilitate design
- Technology was specifically designed with scalability in mind; team conducted analytical fluid dynamics studies to ensure that the coating could be succesfully administered in a large-scale fashion(i.e. industrial spray-coating) contexts
- Raised additional research funds through the competitive grants and pitch presentations (Engineer of the Future Fund recipient, Quantum Valley Problem Pitch Finalist)

Methanol Synthesis using Solar PV and Carbon Capture

TU Delft ME45180: Energy Storage

- Proposed a renewably-sourced feedstock plant near a factory to capture and use emitted carbon dioxide for methanol synthesis in a report and a technical presentation
- Determined mass and energy flows for the facility and estimated CAPEX and OPEX to investigate feasibility