Alex Vena

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Career Highlights

- **Multidisciplinary skillset**: Programming (*Python, Java, C, SQL*), front-end web development (*HTML, CSS, JS*), data analysis, project management, experimental design, business dev., nanomaterials, polymer & organic chemistry, materials R&D
- **Real-world problem solving and innovation in multiple fields**, including:
  - Developing a non-toxic antifouling paint with 5x durability for marine vessels
  - Fabricating an antimicrobial filament with 97% efficacy for food-safe 3D printing
  - Designing a consumer packaging plastic with improved removal of viscous fluids
- **6 years of collaborative research and development experience** in materials science for industry and academia, resulting in 4 co-authored papers and 2 patents

Education

Masters, Computer and Information Technology — **2021 - Present**
University of Pennsylvania, USA

- Courses: Introduction to Software Development (Python & Java), Discrete Mathematics, Introduction to Computer Systems, Data Structures and Software Design

BASc, Honours Nanotechnology Engineering — **2011 - 2016**
University of Waterloo, Canada

- Top student in Faculty of Engineering **(**4.00 GPA | 96.3%**)**
- Recipient of Governor General's Silver Medal, Sanford Fleming Academic Achievement Award, Norman Esch Entrepreneurship Award and various scholarships

Work Experience

Strategic Project Engineer — **2016 - 2020**
Adaptive Surface Technologies (AST), Cambridge, MA

- Led technical development of an ecofriendly marine coating for a multimillion DOE grant; engaged regularly with prospective customers for product feedback, and modified product accordingly to better align with real-world requirements
- Automated feature and statistical analysis for hundreds of microscopic coating images with MATLAB to assess product variability during manufacturing
- Prepared an NSF SBIR Project Pitch and Phase I grant proposal to investigate the antiviral efficacy of novel surface active polymers against SARS-CoV-2
- Managed R&D team that developed patent-pending epoxy and polyurethane marine coatings with 5x durability and comparable performance to competing products

- Supervised and mentored six undergraduate co-op students between 2017 and 2019
- Designed a multilayer polyolefin bottle through materials and surface engineering with reduced hang-up of viscous fluids and improved recyclability for consumer packaging

R&D Nanotechnology Engineer **2015**
Lumotune Inc., Kitchener, ON

- Engineered a simple, low-cost process to scale-up liquid crystal display (LCD) fabrication, resulting in a 50% reduction in manufacturing times
- Devised optical formulations for LCDs with enhanced opacity, response time and operating voltage using synthesized smectic liquid crystals and metallic nanoparticles

Biomaterials Research Scientist **2013 - 2014**
Harvard University, Aizenberg Biomineralization and Biomimetics Lab

- Designed a novel silicone system to repel complex fluids that has 30% longer performance and facile tunability of material properties during fabrication

Chemical Engineering Research Assistant **2012- 2013**
University of Calgary, Calgary, AB

- Quantified nanoparticle diffusion in a hydrogel to simulate *in vivo* drug delivery, improving the understanding of nanoparticle pharmacokinetics for cancer treatment
- Analyzed the uptake kinetics of a novel MRI contrast agent in mammalian cells to determine ideal surface functionality for early detection of atherosclerosis
- Explored the effect of chemical vapour deposition parameters on the physical and electrical properties of nitrogen-doped carbon nanotubes

Activities and Interests

Volunteering

- Teacher and Mentor for Middle School Students (*Tutoring Plus*) **2019**
- Overnight Coordinator (*Harvard Square Homeless Shelter*) **2013 - 2014**

Interests

Tennis, mathematics, board games, mindfulness, piano, cooking, physical conditioning, badminton, crosswords, fantasy/sci-fi, reading and psychology

Languages

English (*Native*) French (*Fluid - DELF B2*) Italian (*Rudimentary)*