RYAN BRANCH

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EDUCATION

University of Michigan **September 2014 - April 2018**

B.S.E. in Chemical Engineering, Minor in Computer Science **3.54/4.00 GPA**

EMPLOYMENT EXPERIENCE

Freelance Software Engineer **Aug 2020 – Present**

- Consulting and writing custom software, especially data pipelines and analysis tools
- Leading R&D for a cutting-edge robotics project carried out by a Fortune-100 company
- Contributing to open-source decentralized finance projects (both for-profit and volunteer)
- Creating a decentralized SaaS business for trustless data distribution via blockchain

Product Engineer **May 2020 – April 2021**

Photon Semantics (Startup founded from Kotov Lab at UM) **Ann Arbor, MI**

- Developed custom data processing software for R&D in improving LIDAR accuracy

Automation & Controls Engineer **July 2018 – May 2020**

Eli Lilly and Company – Global Process Automation & Control Engineering **Indianapolis, IN**

- Deployed and managed software systems for automation of manufacturing environments

Undergraduate Researcher – Kotov Lab **January 2017 – July 2018**

University of Michigan Department of Chemical Engineering **Ann Arbor, MI**

- Patented a method for LIDAR computer vision, and co-founded “Photon Semantics”

Research Intern – Stroock Lab **June 2016 – August 2016**

Cornell NanoScale Science & Technology Facility **Ithaca, NY**

- Authored a process to fabricate resin micro-rings of targeted cross-sectional geometry

Undergraduate Researcher – Larson Lab **September 2015 – February 2016**

University of Michigan Department of Chemical Engineering **Ann Arbor, MI**

- Published a paper quantifying the kinetics of Layer-by-Layer Deposition in polymers

PUBLICATIONS AND REPORTS

1. Maziar Mohammadi, Ali Salehi, **Ryan J. Branch**, Lucas J. Cygan, Cagri G. Besirli, Ronald G. Larson. "Growth Kinetics in Layer-by-Layer Assemblies of Organic Nanoparticles and Polyelectrolytes." (2017). ***ChemPhysChem*** 18(1): 128-141.
2. **Ryan J. Branch**, Abraham D. Stroock, Neeraj N.S. Borker. "Two-Step Photolithography for Fabrication of High Aspect Ratio SU-8 Rings." (2016). ***2015-2016 Cornell Nanoscale Facility Research Accomplishments***: 202-203.

PATENTS

1. Kotov, Nicholas A.; Glotzer, Sharon; Shahbazian, Brian; **Branch, Ryan**; Xu, Lizhi; Choi, Wonjin; Cha, Minjeong; Spellings, Matthew. "Material-Sensing Light Imaging, Detection, and Ranging (LIDAR) Systems". April 2021. US Patent 10983219.

HONORS AND AWARDS

Omega Chi Epsilon, Beta Theta Chapter Inductee and Board Member, 2016 – 2018

- Honor society for Chemical Engineering students with exceptional academic record
- Elected to serve as **Vice President** in Winter 2017 and as **Secretary** in Fall 2017
- Facilitated volunteer service, social gatherings, and employer career information sessions

Entrepreneurial Achievements and Grants via Photon Semantics, 2017 – 2018

1. Participant, 2017 Joint Toyota Research Institute University Program (**$750,000**)
2. Finalist, 2017 MTRAC Advanced Transportation Challenge (**$160,000**)
3. Finalist, 2018 MTRAC Advanced Transportation Challenge (**$100,000**)
4. Top 4 Finalist, 2018 Zell Lurie Michigan Business Challenge
5. Finalist, 2018 Rice Business Plan Competition

LEADERSHIP AND SERVICE WORK

- **AIChE (2014 – 2015):** Participant in several service events as an organization member.
- **ACS Poly/PMSE (2015 - 2016):** Through the Larson Group, with several grad students, I visited K-8 schools to teach students about polymers, recycling, and careers in science. Developed and delivered presentation content and hands-on experiments for students.
- **Omega Chi Epsilon (2016 – 2018):** As Vice President, I organized volunteer events and donation drives for local nonprofits. I also participated in additional events, as a member.
- **XPlore Engineering (2018):** Through the Kotov Group, with several grad students, I facilitated nanotechnology experiments for children, at a UM summer program.
- **Eli Lilly (2018 – 2020):** Volunteered with a local food bank, "Servant's Heart of Indy", through a program where Lilly made matching donations for each hour of service. Also served as a department leader for Lilly's annual Global Day of Service event.

PROGRAMMING AND TECHNICAL SKILLS

- **Languages**: Highly skilled in Python and strong in C/C++/C#. Also proficient with JS and HTML/CSS along with Django, Jekyll, and Unity. Primarily use SmartPy for DApps.
- **GitHub:** Over 50,000 lines of code in my own projects, many of which are open-source. Wide variety of topics covered including computer vision, image processing, physics simulations, data mining, generative art, smart contracts, and decentralized applications.
- **Libraries:** Python library experience includes Pandas, NumPy, Numba, SciPy, Scikit-Learn, Tensorflow, PIL/Pillow, Matplotlib, Tkinter, and PyOpenGL.
- **Smart Contracts:** Significant knowledge and experience in blockchain datastructures, decentralized applications, and smart contract programming. Most experienced with Tezos (SmartPy and Michelson) and secondarily Ethereum (Solidity) for development.
- **Prototyping:** 4 years of experience in CAD (OpenSCAD/OnShape), 3D printing (FDM), and mechatronic design. 2 years in developing custom Arduino-controlled electronics.