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**

RESEARCH EXPERIENCE

Product Engineer **May 2020 – Present**

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

- Developing both software and hardware for research in improving LIDAR vision

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

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

- Designed devices for automation of LIDAR data collection and other optical experiments
- Patented, as a team of 8 inventors, a novel method for LIDAR-based computer vision
- Co-founded "Photon Semantics" and directly assisted in raising $760,000 of funding

Research Intern – Stroock Group **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 Group **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

ADDITIONAL EMPLOYMENT

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

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

- Implemented automation software at two production sites in China and three in Indiana
- Built and supported hundreds of servers for manufacturing control and error monitoring

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". July 2019. WIPO Patent WO2019139656.

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 SKILLS

- **Languages**: Highly skilled in Python and strong in C/C++/C#. Some experience with MATLAB. Also proficient with HTML/CSS along with Django, Jekyll, and Unity.
- **GitHub:** Over 40,000 lines of code in my own projects, many of which are open-source. Wide variety of topics covered including digital image processing, physics simulations, automation, mechatronics, data mining, 3D graphics, and user interfaces.
- **Libraries:** Python library experience includes Pandas, NumPy, Numba, SciPy, Scikit-Learn, Tensorflow, PIL/Pillow, Matplotlib, Tkinter, and PyOpenGL.

OTHER TECHNICAL SKILLS

- **Prototyping:** 3.5 years of experience in CAD (OpenSCAD & OnShape) and 3D printing.
- **Electronics:** 1.5 years in developing custom Arduino-controlled mechatronic systems.