

## SUMMARY

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Versatile and detail oriented mechanical engineer with startup experience, bringing a medical device from initial prototypes to successful clinical trials on over 130 patients with the world's first RF|PF system. Responsible for many stages of development, including R&D of safety-critical systems, scaling of production, and design verification of device and accessories.

## EDUCATION

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### Carnegie Mellon University

MS in Mechanical Engineering – May 2016

BS in Mechanical Engineering – May 2016, with *highest University and College Honors*

## EXPERIENCE

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### Affera, Inc., Mechanical Engineer

Watertown, MA 2016-Present

- Early stage startup designing a novel minimally invasive surgical device to treat various heart rhythm disorders; resulted in successful treatment of over 130 patients
- Responsible for research and development of several critical systems in product family, brought projects from initial prototypes through to production; resulted in 5 patent families
- Project lead and for an accessory device and accessory tubing kit

### Motorola Mobility, Design Engineer Intern

Chicago, IL Summer 2015

- Designed and sourced PCB shields, display lens, and rear housing for a line of smartphones
- Developed an empirical model that successfully evaluates and predicts the risk of glass shattering based on lens cutouts to inform future designs

## PROJECTS

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### Canva Diamond Technology, Engineer

2015 - 2017

- Patented and prototyped a pad conditioning disk, configured to save costs in CMP process, resulting in one patent family

### Magnetically Controlled Millirobots, Honors Research, Dr. Metin Sitti

2015 - 2017

- Designed and prototyped millimeter scale robots to be controlled by MRI for noninvasive operations
- Mathematically modeled robot behavior and designed PID controls

### Granular Packing Prosthetic Socket, Research Engineer

2015 - 2016

- Prototyped a prosthetic socket designed for mass production that uses granular packing to provide a custom fit, combating patient discomfort

### Google XPrize Lunar Rover, Camera Systems Lead, Dr. William "Red" Whittaker

2015 - 2016

- Worked in the lead team in Google's Lunar XPrize, a \$30 million competition to land a robot on the moon
- Assumed leadership of a team of 6 for the design of camera systems to develop and meet imaging, structural, and vision requirements

### Flying Wing Drone, Grant Recipient and Principal Engineer

2015 - 2016

- Authored and won a \$1000 SURG grant to develop a fast and efficient drone, funded by Boeing
- Designed and prototyped a quadcopter that transforms into a flying wing that takes advantage of lift to increase speeds and decrease energy consumption

- Praying Mantis Robot, Master's Research** 2014 - 2016
- Designed, machined, and programmed robot, achieved functional locomotion and manipulation
  - Tested and optimized robot for reliability and efficiency

- Formula Society of Automotive Engineers, Suspension Engineer** 2014 - 2015
- Designed A-arms using Solidworks and ran FEA analysis
  - Manufactured suspension system using both CNC and manual Mills and Lathes

## LEADERSHIP & ACTIVITIES

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- Fair Foods Harvard Square Food Pantry, Volunteer** 2018 - 2020
- Weekly volunteer rescuing surplus food and distributing them to locals in need of support

- Mentoring, Volunteer Mentor** 2017 - 2020
- Built one-on-one mentor relationships with children in families of need, encouraging them to reach their full potential
  - Guided mentees through finishing high school, SAT preparation, and college application process

- American Institute of Aeronautics & Astronautics (AIAA), Treasurer and Co-founder** 2014 - 2016
- Restarted AIAA CMU chapter after years of inactivity to address a growing campus interest in aerospace
  - Earned several grants for research projects on drone delivery systems

- Newman Club, President** 2012 - 2016
- Significantly enhanced campus presence and student activities, resulting in increase in club membership and club fundraising

- Knights of Columbus, Director of Communications** 2012 - 2016
- Assumed various responsibilities, including Chancellor and Worthy Warden
  - Redesigned communication channels and membership recruitment to increase attendance and activities

## PATENTS & PUBLICATIONS

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### Granted Patents

Catheter Sensing and Irrigation - US15/584,904, EP17722967.1A, PCT/US2017/030575, CN201780041499.2A, JP2018558328A

### Pending Patents

Lesion Formation - US15/584,323

Pulsed RF Ablation - US15/584,533, US15/584,549, PCT/US2017/030535

System comprising a catheter and an expandable electrode and a method of forming a lesion - EP17733199.8A, PCT/US2017/030518

Catheter Insertion - US15/584,080, EP17723204.8A, PCT/US2017/030492

Multiple Zone Pad Conditioning Disk - US16/582,452, TW108134870, KN10-2019-0119170, CN201910917992.7

### Publications

Erin, O., Giltinan, J., **Tsai, L.**, Sitti, Metin. (2017) "Design and actuation of a magnetic millirobot under a constant unidirectional magnetic field." IEEE, ICRA 17058289