Luke Tsai

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EDUCATION

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

EXPERIENCE

Affera, Inc., *Mechanical Engineer* *Watertown, MA* 2016-Present

- Early stage startup working on design of a novel minimally invasive surgical device to treat various heart rhythm disorders
- Research and development of several critical systems in product family, bringing projects from initial prototyping stage to scaling for production
- Contributed to writing design verification test protocols, test procedures, and training and overseeing execution

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

Magnetically Controlled Millirobots, *Honors Research, 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, Prof. 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

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LEADERSHIP & ACTIVITIES

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

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

Granted Patents

Catheter Sensing and Irrigation
US20170312028A1, EP3451962A2, WO2017192542A3, CN109414286A, JP2019515755A

Pending Patents

Lesion Formation
US20170312024A1

Pulsed RF Ablation
US20170312007A1, US20170312025A1, WO2017192510A2

System comprising a catheter and an expandable electrode and a method of forming a lesion
EP3451961A1, WO2017192495A1

Method of inserting a catheter with an expandable tip and a system comprising a catheter, a sheath and an insertion sleeve
EP3451954A1, US20170312020A1, WO2017192477A1

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