

# TARUN SUBRAMANIAN

Northwestern University  
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## EDUCATION

**Northwestern University – The Graduate School**  
*Master of Science in Mechanical Engineering*

*Sept 2017 – Dec 2018*  
CGPA: 3.94/4

**Anna University – SSN College of Engineering**  
*Bachelor of Engineering in Mechanical Engineering*

*July 2013 – June 2017*  
CGPA: 3.9/4

## SKILLS

SolidWorks, Fusion 360, EAGLE (MCad-ECad Integration), MATLAB, Mathematica, CCS Cloud, Atmel Studio, GitHub

## EXPERIENCE

**Mechatronics Engineer, PedalCell, USA**

*June 2018 - Present*

- Managed product testing protocols, including the construction of an automated bicycle rider & outdoor condition testing rig designed to withstand 10,000 mile sprints & controlled by a custom MATLAB interface to capture product performance datasets.
- Spearheaded product design revisions obtained from quantitative testing datasets & user interviews to fabricate weatherproofing and bicycle mounting modules for product enclosures.
- Co-developed the power filtering electronics & energy storage architecture utilizing EAGLE and Atmel Studio to processes the fluctuating electricity obtained from a bicycle into a steady and continuous stream of power via a mixed A/D circuit design.
- Participated in product pitch and networking events to connect with seed investors and spur the firm's bicycle brand customer pipeline worth \$.5M.

**Graduate Student Researcher, NxR Lab, Northwestern University, USA**

*Oct 2017 – Dec 2018*

- Captured the impulse response of the natural materials that vary in their frequency response by using a piezoelectric plate.
- Added these responses obtained with a square wave friction profile and then displayed these convoluted signals on an electrostatic friction modulation device.
- Conducted psychophysical experiments to identify the key parameters of the convoluted signals by which we could map natural texture on an electrostatic friction modulation device.

**Summer Research Intern, Indian Institute of Technology, Kanpur, India**

*June 2016 – Aug 2016*

*Design of De-Spinning Mechanisms for Dual Spin Ballistic Projectiles*

- Analytically derived 6 D.O.F dynamic model to predict altitude, range trajectory of projectile on MATLAB.
- Canard was designed on SolidWorks based on roll-moment requirement for various velocities of the projectile and Roll isolation bearing was selected based on axial and thrust loads

## PROJECTS

**Autonomous Mobile Robot, Northwestern University, USA**

*Mar 2018 – May 2018*

- Constructed and assembled a three wheeled robot in which the motors where controlled by a PIC32 microcontroller. The robot was fabricated using acrylic sheets which was laser cut and 3d printing.
- An android application was developed which is used to detect the line on the map and exchanges information via USB CDC with the PIC32 microcontroller which in turn controls the motor.

**Motor Control, Northwestern University, USA**

*Jan 2018 –Mar 2018*

- Developed a position controller using PID algorithm for a Motor to follow a desired trajectory which is given by the user.
- The hardware consists of a PIC32 microcontroller, MAX9918 current sensor and DRV8835 H-Bridge.
- A simple user interface was created using MATLAB which provides the user with 15 options: from reading the encoder values, setting current and position gains to plotting trajectories.

**Design and Fabrication of Go-Kart, Go-Kart Design Challenge 2016 (GKDC), India**

*April 2015 - Feb 2016*

- Modeled the chassis of the Go Kart using SolidWorks.
- Developed an auto engine cutoff system which was modeled to cut off the engine should a failure occur in the breaks.
- Go-kart was placed 16th overall and 3rd in Handling Tests in GKDC.

## PUBLICATION

**'Wood Plastic Composite', National Conference for Mechanical Engineering Research Scholars**

*March 31<sup>st</sup>, 2017*

- Developed WPC from waste pine wood flour compounded with Polypropylene and talc powder
- Characterized the mechanical properties of the material. Aimed at developing a material feasible for 3D printing.
- Recipient of the SSN student research grant (March 2015), at SSNCE, Chennai