



# High Efficiency, Nanopower Voltage Step-Up Converter

## Current Job: Researcher, MIT Media Lab

**Conformable Decoders Group:** Feb 2018 - : Designing and microfabricating MEMS energy harvesters to generate power from human bodily movements for use in self-powered sensors, especially for disease detection and therapy.

## Ordering Information

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U.S. Citizen

## Papers

**Published:** Lili Wang, Eugen Panaitescu, Farita Tasnim, Enrico Fontana, and Latika Menon. 2017. Iron Oxide Decorated Titania Nanotubes for Solar Energy Harvesting Applications. Journal of Nanoscience and Nanotechnology 17, 3, Article 7 (March 2017), 27 pages. <https://doi.org/10.1166/jnn.2017.12824>

**Working:** Farita Tasnim, Asta Roseway. 2018. Kinetic Peacock: Sustainable Electronic Fashion Powered Entirely by the Human Body. *TEI*.

## Teaching Experience

### YEP (Youth Electronics Program) Bangladesh

**Founder:** Jan 2017 - : Started a new initiative at MIT, partnered with JAAGO Foundation, aimed at stopping the cycle of poverty through education. Obtained funding from MIT's D-Lab, created a custom curriculum for a three week workshop to teach Bangladeshi Class VI students coming from Dhaka slums how to design basic circuits and build them on breadboards. The students' culminating project is a heartbeat monitor built around a PPG sensor.

**MIT MISTI GTL Israel:** Jan 2017: Taught first year Israeli college students at ORT Yami to read and understand datasheets as well as debug circuits.

**6.01, 6.169, 6.101(x2) Lab Assistant:** Feb - May 2018: Taught MIT students: how to break down complex electronics and programming problems into do-able chunks, how to design, test, and debug analog and digital circuits. Helped run lab sessions and shape teaching methods.

**Girls, Inc:** June 2013 - June 2015: Taught underprivileged girls, often also minorities, various topics in math and science. Helped coach their FLL Robotics team as well.

## Accolades

NCWIT Collegiate Award  
Honorable Mention (\$2.5K)

22 Under 22 Most Inspiring  
College Women

Microsoft Scholarship (\$10K)

Proton Onsite Energy  
Scholarship Winner (\$36K)

Regional STAR Student

FIRST Robotics Regionals,  
First Place Alliance Captain  
and Regional Winner

NCWIT Aspirations in  
Computing National Runner  
Up and State Winner

Math Prize for Girls

Georgia Governor's Honors  
Program: Mathematics

National Merit Scholar  
Semifinalist

Research Science Institute  
Scholar (3% acceptance rate)

Georgia ARML Team

MIT THINK: Ntl. Runner Up

FLAG French Foreign Language  
Spoken Contest Perfect Score

SAT Score of 2380 in 9th grade

FIRST Robotics Rookie-All Star  
Award

Georgia MATHCOUNTS,  
1<sup>st</sup> Place Overall

## Features

Massachusetts Institute of Technology  
Major: Electrical Engineering  
Class of 2019; In-Major GPA: 4.9

Columbus High School  
Valedictorian  
Class of 2015

## Maximum Ratings

## Courses

PCB Design	●●●●●	Adobe Photoshop	●●●●●	6.003	6.011
PCB Layout	●●●●●	Adobe Illustrator	●●●●●	6.301	6.036
SolidWorks	●●●●●	Autodesk Inventor	●●●●●	6.525	6.021
PTC Creo	●●●●	Ham Radio	●●●●●	6.101	6.320
C	●●●●●	Objective-C	●●●●	6.009	
Java	●●●●●	LTSpice	●●●●●		

## Electrical Characteristics

### Electrical/Energy Engineering Intern, Microsoft Research:

June 2017 - Jan 2018: Worked on developing body energy harvesting solutions in order to reduce form factor and energy needs of wearables. Created a novel electronic outfit, Kinetic Peacock, that is powered entirely by the body. When walking, the outfit harvests energy via a knee energy harvester and powers a stunning peacock display. The outfit is made entirely out of recyclable materials and has a low impact environmental life cycle.

### Electrical Engineering Intern, Microsoft Hololens:

June - Aug 2016: Developed a flexible PCB for the bring-up and testing of internal Hololens motherboards. Involved digital circuitry design, PCB layout, system integration.

### Analog Electronics Lab Final Project:

March - May 2016: Developed a custom, high precision fluxgate magnetometer made with an amorphous metal core and its accompanying instrumentation circuit which gathers data on magnetic field using phase demodulation and can be used as an ammeter.

### Electrical/Energy Engineering Intern, Intel Corporation, New

**Devices Group:** June - Sep 2015: Created PCB's, firmware, and an integrated product to harvest and analyze natural sources of energy from action sports to a) charge phone batteries and b) power sensors without batteries, which reduces form factor, maintenance, and market advantage.

### Independent Research for Harvesting Ocean Wave Energy:

Aug 2014 - May 2015, 730+ hours: Developed a novel adaptive energy harvesting system. Designed and built the mechanical structure and PCB's, programmed in C. Device calculates raw input energy of waves and converts the generator's AC power into usable energy in one of three selectable modes: 1) battery charging, 2) electrolysis, and 3) resistor load. Sends the data via WiFi to a custom iPhone app.

### Independent Research for Increased Solar Energy Harvesting

**Efficiency:** Oct 2013 - present, 600+ hours: Constructed a compact solar site surveyor device (PCB, C firmware, and mechanical structure) that tracks the sun, measures the solar current generated for any given spot, and communicates via Bluetooth to an iPhone app to track solar output of different locations, helpful in determining the optimal placement of solar cells in cities.

### FIRST and BEST Robotics:

Jan 2012 - May 2015, 2,000+ hours: Captain of a team of 15-20 students. Every year, we created a 120-pound robot in 6 weeks in the spring and a 24-pound robot in 6 weeks in the fall. Instilled infallible work ethic and dedication in team members, ensured effective CAD design, wired the electronics, and wrote code in Java and C for sensor input, actuator control, vision processing, automated sequences, and joystick control.