AMNA A. MAGZOUB

PROJECT PORTFOLIO

MECHANICAL ENGINEERING

MIT ‘17

HI. I AM AMNA MAGZOUB.
MIT 2017. MECHANICAL ENGINEER.
PRODUCT DESIGNER.
BIOLOGY NOVICE.

I'm seeking full-time opportunities as a Product Designer and Engineer. If you like my work, please contact me at amagzoub@mit.edu.

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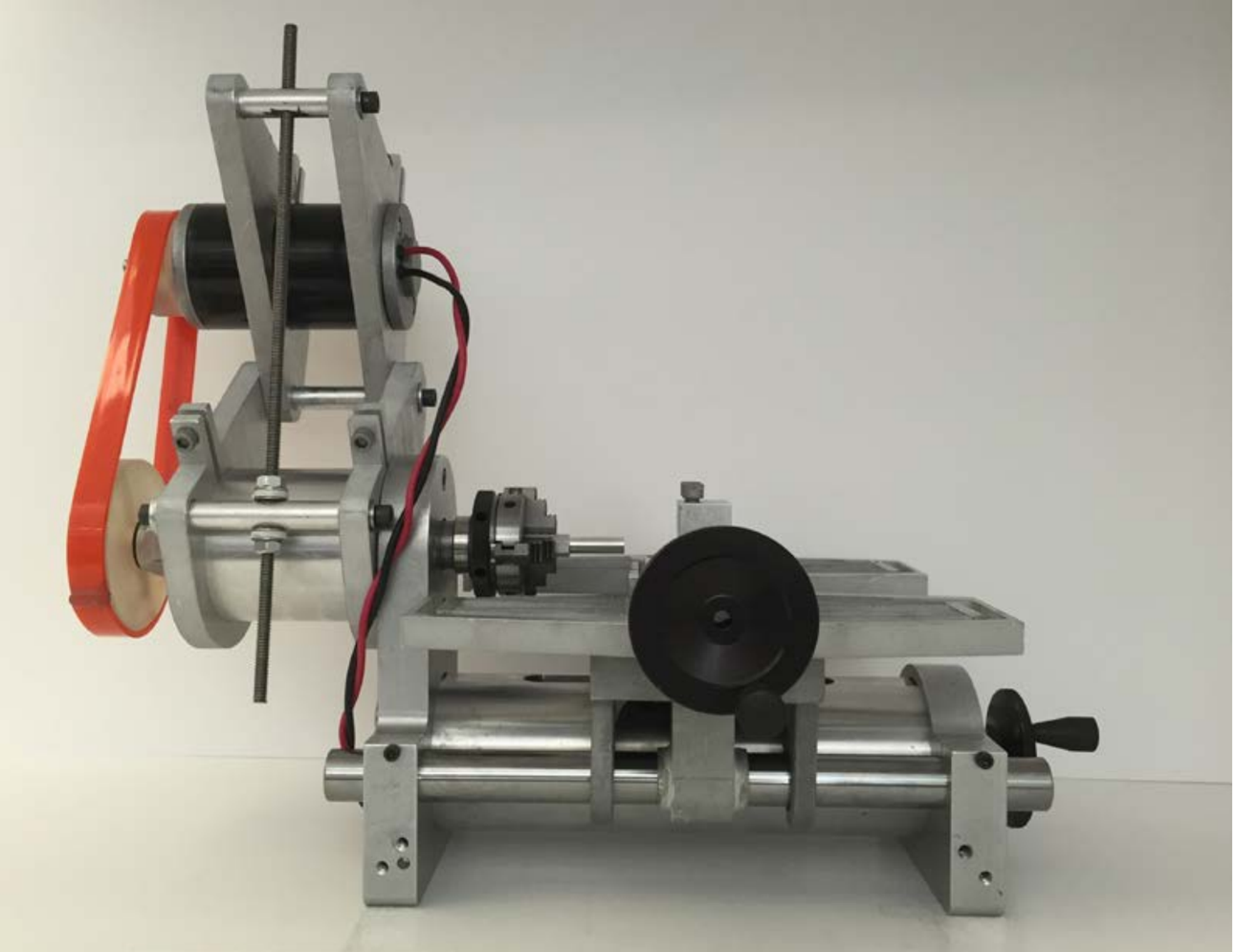
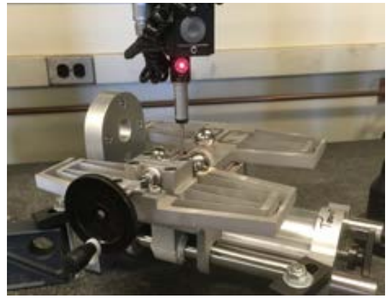
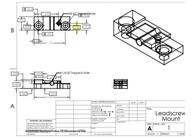
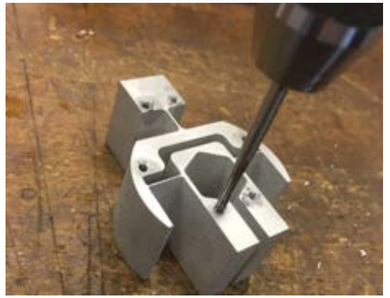
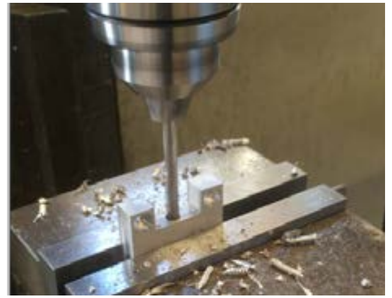


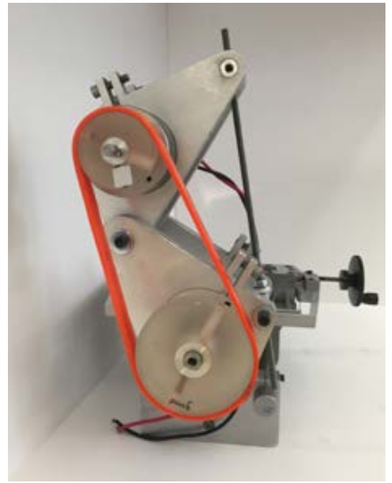
ELEMENTS OF MECHANICAL DESIGN





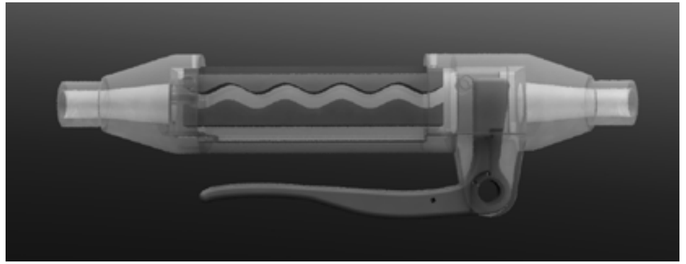






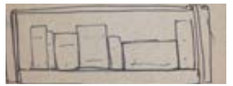
My team of five was tasked to design, build and test a robust desktop lathe, that could turn 0.6" OD aluminum. I designed the motor mount sub-system, 3DP and thermoforming processes and assisted with fabrication. As CAD Guru, I managed CAD files for parts/assemblies and produced drawings. As Documentation Guru, I was responsible for part acquisition, budget management and maintaining team schedule. I also managed documentation of all parts, which included photos of fabrication, videos of assembly, experimentation and references to calculations and models.

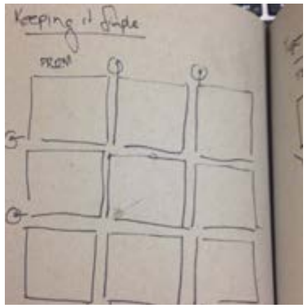
PRODUCT ENGINEERING PROCESSES, *STRIDE*

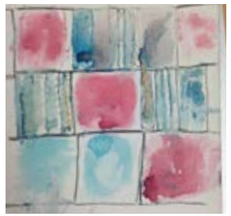


In this class, I was one of the two System Integrators, responsible for leading a team of 18 engineering students to create a product in three months, under the theme “Rough, Tough and Messy”. The final product, Stride, is a double braked rollator that exists in a stationary locked-state when not in use, and utilizes the user’s weight to unlock it when in needed. Throughout the term, I had to wear several different hats. Most times, I lead and organized my sub-team through meetings and planning, and coordinated with instructors and mentors. At other times, I worked in the lab machining and testing prototypes, from PVC or Aluminum tubing. I took initiative in developing the storyboard and product contract, thus defining product vision. I lead all 3D printing operations and trained three team members to use SLA and FDM and printers. I became the technical lead managing the design, fabrication and delivery of the product in time for presentations.

HOW TO DESIGN (ALMOST) ANYTHING, *SMART SHELVES*





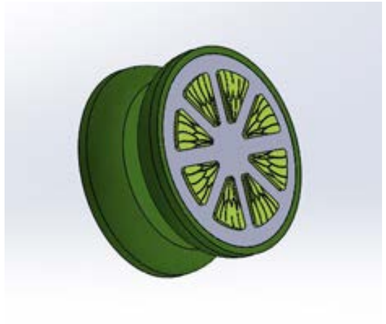



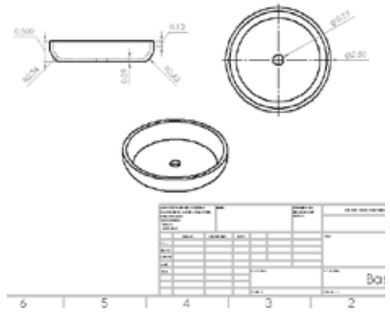


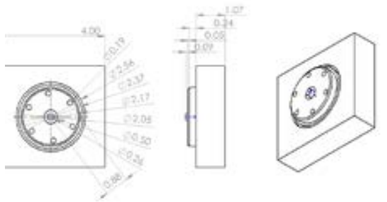


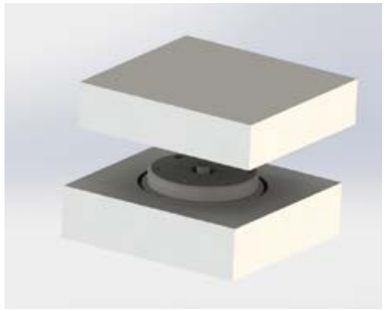
In this studio style class, I met weekly with my class and instructors to work on a project under the theme “light”. My project was a set of “smart shelves”, with embedded LEDs that light up when an item on that shelf is looked up on an external directory. The design was to incorporate a “smart” feature to an everyday object such in a non-obtrusive manner. It’s modular to add additional “pixels” to the grid. Throughout this class, I learned sketching, sketch modeling and rapid prototyping and woodworking. For more information about my progress and previous prototypes, directions, please follow my website for the class through the link, amag-zoub.github.io/howtodesign

DESIGN AND MANUFACUTRING II, *C1TRUS*



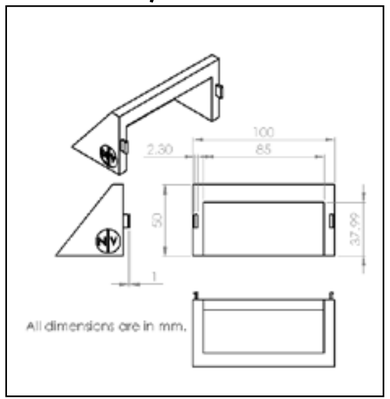


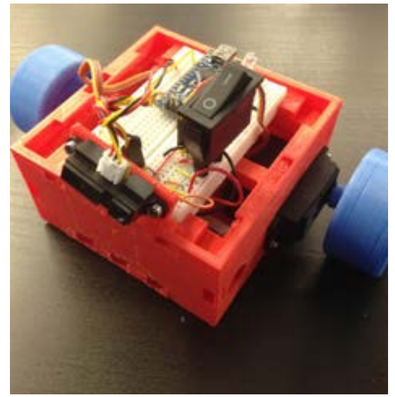


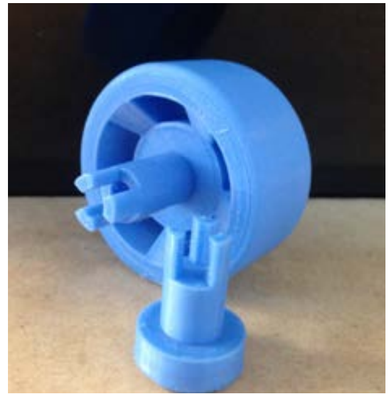


In this class, I learned design for manufacture and assembly (DFM/DFA), process optimization, CNC machining, injection molding and thermoforming. I was responsible for designing and manufacturing 100 of the outer bases, using SOLIDWORKS and MasterCAM for CAD/CAM, ProtoTRAK and a BOY Injection Molding machine. To see more about this project, please follow our website, c1trus-yoyo.blogspot.com

NVBOTS, *SUMOBOTS AND ANIMALS*

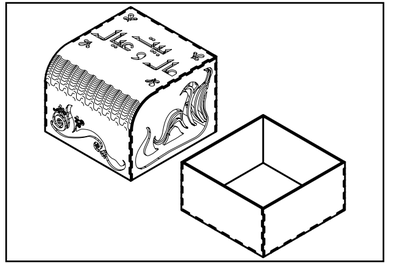


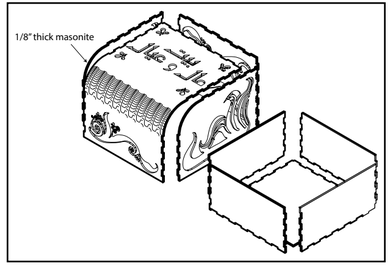


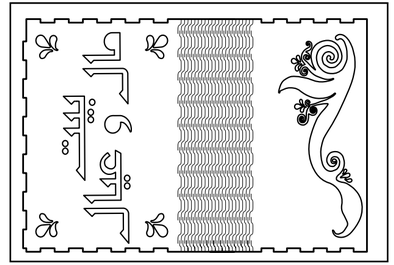


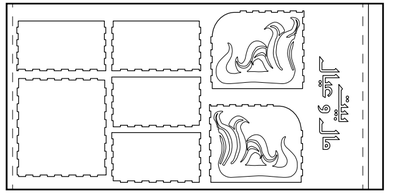
At New Valence Robotics (NVBOTS), I designed two lesson plans, in conjuction to the common core to be used with their FDM 3D printers. The first, geared towards middle schoolers, teaches animal bone anatomy. The second, geared towards high schoolers, guides students through the process of designing, assembling and programming their own Sumobots to battle with.

INTRODUCTION TO GEOMETRIC DESIGN, *DESIGNING A BOX*



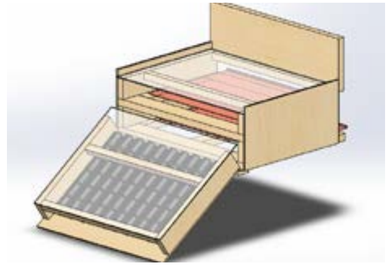






In this exercise, I designed and fabricated a box inspired by Sudanese wedding symbolism, such as henna and greetings. The box is a part of a two part assignment where interlocking letters were later fabricated to fit into the box. Through the exercise I learned how to use Adobe Illustrator, Rhino 5, and Autodesk's 3DMAX for rendering. I also learned about designing finger joints, kerfing and laser cutting.

D-LAB, *VOCA MEMBER AND TECHCON INNOVATOR*



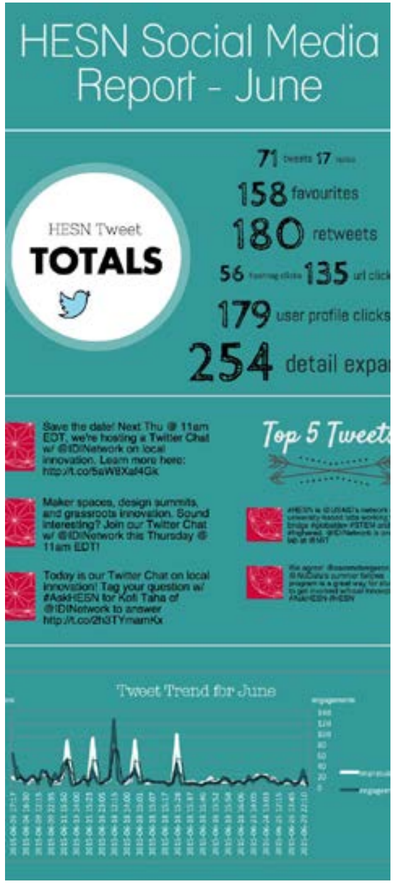
While a member of Voca, a research group out of the Development Lab (D-Lab), I helped design and build a solar dryer to reduce moisture in avocados to better prepare them for pressing to extract oil, in partnership with a local community in Leguruki, Tanzania. I was responsible for market research and some experimentation as well as heavily assisting in the fabrication of the first prototype. Later on that semester, I also participated in USAID's TechCon conference in Berkeley, CA as an innovator and represented Team LIFT (Local Innovation Facilitation Team), presenting the potential for researching innovative communities such as the one in Leguruki, in order to create a Local Innovation Index. We reached the semi-final round.

USAID, *VISUALIZING DATA FOR HESN*

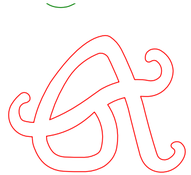
USAID FROM THE AMERICAN PEOPLE

U.S. GLOBAL DEVELOPMENT LAB Powered by USAID

In the summer of 2015, I interned with USAID's Higher Education Solutions' Network team. I worked on data and project management, graphic design and data visualization. I also had the opportunity to volunteer at the Young African Leaders Initiative Conference, (YALI) and meet many highly esteemed personnel, including the USAID Acting Administrator, Alfonso Lenhardt.



MISCELLANEOUS SKETCHES, DOODLES AND DESIGNS



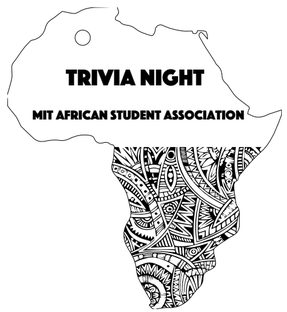
Amna Magzoub

Side View

Isometric View

Top View

Front View



Here are a few examples of things that display other artistic ventures I took on. Works featured, sketches from my drawing class (cover and bottom left - graphite), a couple of portraits from my portrait collection, design assignments from my Intro to Geometric Design class as well as a chair design, and a key-chain designed and laser cut into acrylic for the African Association's Trivia night.

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