Jonah Embry-Seckler

Inventor, Engineer, and Student

Aiming to help push the world towards a new, cleaner era through sustainable energy and smarter technology. Interested in integrated electrical systems, smart devices, and spaceships.

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WORK EXPERIENCE

Researcher

Duke Acoustofluidics Research Group

06/2018 – Present

Duke's Acoustofluidics Research Group is a world leader in small particular manipulation using sound waves. Their research focuses specifically on acoustic tweezers, sharp-edge-based acoustofluidics, bubble-based acoustofluidics, acoustofluidic-based MicroTAS, and optofluidics and plasmofluidics

Intern

CNE Creative Enterprises

05/2017 – 08/2017

CNE Creative Enterprises is a research and design company specializing in electronics and manufacturing. CNE has built everything from circuit boards and water processing controllers to spy satellites.

Founder and Product Architect

Bulldog Creative Designs LLC

05/2015 – 05/2017

Bulldog Creative Designs specialized in custom LED signs and lighting fixtures. This company was designed by a group of ambitious high school students studying engineering and business. The signs used vinyl, acrylic, and injection molded components (designed inhouse).

PERSONAL PROJECTS

RC Hydrofoil

(01/2020 – current)

- Designed and simulated a full body model using SolidWorks to determine thrust requirements
- Uses an outboard 55-lb thrust motor
- Controlled using an RC transmitting and receiving unit
- Ailerons fitted directly to waterproof servos, giving additional stability and control in the water

COM Kidney Stone Phantoms

(01/2020 – current)

- Designing artificial kidney stones for instrument testing
- Current focus on using organic polymers a binding agent
- Future designs may incorporate Bego-COM hybrid model

Raspberry Pi-based Satellite Communication System

(08/2019 – current)

- Uses the Iridium Satellite network, giving global coverage
- Open source using off the shelf components
- Gives internet access without the local provider

Autonomous, Underwater Payload Delivery System

(08/2019 – 12/2019)

- Launched from 200 psi air cannon into a swimming pool
- Capable of S-Turns and Barrel Rolls maneuvers
- Navigated towards flashing LED strip using digital PID control
- Communicated information through XBee wireless transmission

Open-Source Automated Dorm System

(03/2018 – 08/2018)

- Designed around the Raspberry Pi Platform
- Created an alarm system which could contact owner, RA, or campus police
- Integrated Alexa voice commands and triggers
- Featured power saving mode activated using mobile phone GPS
- Incorporated a motion sensitive nightlight

DEMOSAT High Altitude Payload

(05/2017 – 06/2017)

- Received funding from UNCO, NASA, and the Colorado Space Consortium
- 5th payload of a mission to determine the origin of cosmic radiation
- 3D printed an ABS frame which was bonded to insulted fiberboard
- Created high energy particle sensor array using Geiger counter, scintillator,
- Recorded data onto microSD card
- Launched successfully on August 21, 2017 during solar eclipse
- Measured muons at high altitude (~100,000 feet)

EDUCATION

Mechanical Engineering and Material Science

Duke University

08/2017 – Present *Major GPA: 3.213* *Cumulative GPA: 3.118*

Relevant Courses

- Mechanics of Solids
- Struct/Prop. of Solids
- Engineering Projects
- Fluid Dynamics
- Fund. of Mechatronics
- Thermodynamics
- Controls
- Engineering Innovations

TECHNIAL SKILLS

Product Design | CAD Modeling | CAD Simulation | CAM Rendering | IoT Design and Propagation | Circuit Design and Simulation | Soldering | Microsoft Office | PCB Design | Microcontroller Programming | Linux Environment | Machine Learning Algorithms | Laser Cutting | Waterjet Manufacture | Manual Milling

ORGANIZATIONS

Duke Acoustofluidics Research Group (01/2020 – Present)

Researcher- Works on point of care devices and cost reduction auxiliary systems using open source technology with a focus on the Arduino platform.

Zauscher Research Lab (01/2020 – Present)

Researcher- Design and manufacture of calcium oxalate monohydride kidney stone phantoms using bovine serum albumin.

Delta Kappa Epsilon (03/2019 – Present)

Treasurer, Recruitment Chair- Joined the organization with 3 remaining members, radically shifted the organization and increase the size to 13 active members.

Duke Battle Bots Team (03/2019 – 12/2019)

Founder, Electronics Team Lead- In charge of system communications and powertrain for 5 different 3-pound combat robots. Also designed and fabricated polycarbonate arena and raised initial funds ($4,500).

LANGUAGES

Human:

English, German, Basic Mandarin

Programming:

Python, C++ (Arduino IDE), Intermediate Java, basic Javascript, Matlab, LaTeX

PUBLICATIONS AND AWARDS

Pratt Web article on Duke Battle Bots Hackathon	*(09/2019)*
Publication in the Royal Society of Chemistry: Lab on a Chip	*(06/2019)*
Awarded $4,500, founded DUKE Battle Bots Team	*(04/2019)*
National Hispanic Scholar	*(08/2016)*
Raised $1,500 from local organization, founded UHS Robotics	*(7/2015)*

INTERESTS

Space Engineering | Rocketry | Clean Energy | Science Fiction | Exoskeletal Systems | Smart Devices | Artificial Intelligence | Human-Machine Interface | Future