Elijah Cobb

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EDUCATION

Michigan Technological University:

Ph.D., Computer Science *(2022 - TBD)*

B.S., Computer Science *(2017 - 2021, 3.51 GPA)*

RESEARCH

Research Assistant | *Planetary Surface Technology Development Lab, MTU* | pstdl.com

NASA - LuSTR | *May 2021 - Present* | Article on “nasa.gov”

Development of a mobility platform and implementation of test procedures for adapting a percussive cone penetrometer, ground-penetrating radar, and an active Z-stage provided by HoneyBee robotics for NASA.

PSTDL - HOPLITE Rover | *May 2021 - Present*

Development of control, communication, power, mobility, sensors, vision, and autonomy software for the Heavy Onboard Platform for Lunar ISRU and Terrain Excavation (HOPLITE). Developed with C++ and ROS. Its mission control software uses the custom-made ‘PSTDL-UI’ mission control software library.

NASA - T-REX Rover | *May 2020 - Present* | Article on “nasa.gov”.

Design and development of communication, vision, and control software as well as designing and following test procedures for the NASA award-winning rover, the Tethered permanently shadowed Region EXplorer (T-REX).

NASA - Watts on the Moon - W^5 Mission | ***Aug 2021 - Present*** | **Article on “nasa.gov”.**

Developing concepts of operations for delivering and storing energy for beneficiation and electrolysis facilities on the lunar surface. Received the grand prize for Phase I and currently designing Phase II submissions.

PSTDL - IRGO | *Aug 2020 - Present*

Design and development of all software for a 3-axis autonomous gravity offloading system housed in a lunar simulant chamber. IRGO uses OpenCV with an infrared LED and camera to continuously provide an upwards force on a subject to accurately simulate mobility on the lunar surface using the PSTDL’s LHT-01A lunar simulant sandbox.

PSTDL - UI | *Aug 2021 - Present* | Documentation on “github.com”.

Development of a software framework providing all necessary functionality for mission ground control software actively used by NASA T-REX, PSTDL IRGO, and PSTDL HOPLITE for the NASA LuSTR project.

Undergraduate Fellow | *Michigan Technological University* | mtu.edu/computing

Universal Sensor Definition Schema (USDS) | *Nov 2020 - Present* | SBIR on "navysbir.com".

Development and validation of a language providing an interface between sensor data streams using Racket for research supported by the U.S. Navy through an SBIR (N20A-T010) with Applied Research in Acoustics Inc (ARiA).

Shakudo | *May 2020 - Mar 2021* | Article on "mtu.edu".

Development of a block-based language interface into the Alloy language and analyzer, allowing users to express mathematical constraints and get feedback from the analyzer while abstracting away syntactic details.

FEWConscious (FEWCON) Project | *Nov 2020 - Present* | Grant on “nsf.gov”.

Development of internal databases as well as progressive web applications for researchers. FEWCON is a study of over 200 households looking at their environmental impacts supported by the National Science Foundation.

AWARDS

NASA Watts on the Moon Award | *May 2021* | Article on “nasa.gov”.

NASA Artemis Award | *Jan 2021* | Article on "nasa.gov".

Fellowship, Michigan Technological University | *May 2020* | Article on "mtu.edu".

PUBLICATIONS

Peer-Reviewed Journal Papers

I. 2021, M. Guadagno, P.V. Susante, Elijah Cobb, H. McGillivray, E. Van Horn, T. Gronda, T. Wavrunek, A. Goddu, C. Miller, "Testing and Development of the Tethered-permanently shadowed Region EXplorer (T-REX): a rover designed to lay superconducting tether into Lunar PSRs," New Space, ISRU Special Issue, Mary Ann Liebert Publishing, submitted 6/21/2021

Conference Proceedings & Other

I. 2021, P.V. Susante, Elijah Cobb, A. Goddu, H. McGillivray, C. Miller, E. Van Horn, Design and implementation of the Heavy Onboard Platform for Lunar ISRU and Terrain Excavation (HOPLITE) to enable payload development and field testing for lunar and mars applications, LSIC, submitted 8/31/2021.

II. 2020, M. Guadagno, P.V. Susante, Elijah Cobb, H. McGillivray, E. Van Horn, T. Gronda, T. Wavrunek, A. Goddu, C. Miller, The Tethered permanently shadowed Region EXplorer (T-REX), NASA BIG Idea, technical paper submitted 1/6/2020.

III. 2020, Elijah Cobb, C. Wallace, Designing Scaffolded Interactive Instruction in Discrete Mathematics, proposal submitted 2/7/2020.

INDUSTRY EXPERIENCE

Ampel Feedback | ampelfeedback.com

Software Engineer | *Dec 2017 - Feb 2020*

Developed the back-end software for Ampel Feedback consisting of REST API libraries, database drivers, and much more. In addition, developed a native iPad application for the Ampel ecosystem to be used as POS kiosks.

Solution Studio | solutionstud.io

Software Engineer | *Jun 2017 - Dec 2017*

Worked as a full-stack developer for Solution Studio providing contracting and specializing in custom-made software. Focused on developing iOS applications and implementing backend software.

SKILLS

Languages	TX	Robotics	Web Libraries	Databases	API	Professional
C/C++	UDP	ROS	ElectronJS	MongoDB	Rest	Academic Writing
Python	TCP	OpenCV	Svelte	MySQL	WS	Documentation
TypeScript	HTTP/S	Control Systems	React Native	MariaDB	GraphQL	SCRUM
Rust	WS/S	Networking	ReactJS	PostgreSQL	Auth	Agile
Racket	I^2C	Systems Programming	NextJS	Parse		Microsoft Office
Java/C#	CAN	Microcontrollers	Web	Firebase		Google GSuite
Objective-C	SPI	Systems Engineering				Github Toolset
Swift						

PROFESSIONAL SOCIETIES

Lunar Surface Innovation Consortium | lsic.jhuapl.edu

Member of the LSIC mobility subteam. Active with other LSIC events/presentations.

MTU Aerospace Enterprise | aerospace.mtu.edu

Integration of subsystem software drivers for the "Auris" CubeSat. Auris monitors radio frequencies of satellites while in orbit and is funded by the United States Air Force. The Auris team recently won the AFRL competition and is maturing Auris into a flight-ready model for a launch within the coming years.

FRC Robotics | raptors1711.com

Member of the software subteam on the FRC 1711 team. Developed an application used by many teams throughout Michigan that enabled tracking of games, metrics, leaderboards, and inter-team communication.