Thomas Stucky

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Work Experience

KBR Inc. — Salt Lake City, UT
Software Engineer — *September 2020 - Present*

Voxel-based Terrain Composition. Designed and developed a Gazebo plugin that superimposes a material distribution over a terrain model.

ROS Action Infrastructure. Refactored over 3k lines of scripts into a more modular and robust python package.

Sample Handling Model. Built a system of ROS nodes that enable sample collection and end-effector dig force injection into a Gazebo lander simulation.

FOSS Development. Jira ticketing and GitHub source code hosting, issue tracking, and code reviews.

Remote Collaboration. Entirely remote work that requires self-driven productivity and frequent collaboration in order to meet project goals.

SETI Institute — Mountain View, CA
Systems Developer — *May 2017 - July 2020*

Physics Engines. Modeled off-world lander terrain interactions (e.g. scooping, digging, poking) using discrete element method to simulate granular material.

Artificial Intelligence. Programmed an autonomous flight-plan execution system with contingency planning.

Embedded Software. Payload software lead for a Mars-analogue rover that demonstrated autonomous sample handling, scientific instruments, and operational procedures at Mars analogue sites in the Atacama Desert.

NASA Ames Research Center — Mountain View, CA
Research Intern promoted to Consultant — *July 2015 - May 2017*

Data Science and Visualization. Scripted a data pipeline that processed and visualized drill telemetry to provide drill engineers and geologists with valuable subsurface data.

Fault Isolation, Detection, and Recovery. Designed and iterated upon autonomous fault diagnostics and recovery algorithms for a flight-like Mars drill.

Networks. Integrated several embedded devices via the POSIX socket API and a publish/subscribe middle-ware.

University of Wisconsin-Madison — Madison, WI
Research Intern — *Summer 2013*

Radio Astronomy. Modeled a radio interferometer telescope to optimize antenna baseline for a target signal.

Prototyping. Fabricated a working prototype of a radio antenna for beam testing.

University of Utah — Salt Lake City, UT
Research and Teacher Assistant — *August 2012 - May 2015*

Data Mining. Scripted an anomaly detection algorithm to search the Kepler space telescope dataset for light curves that indicate a collision of two extrasolar bodies.

Acoustic Testing. Fabricated ultrasonic thermo-acoustic heat engines and tested them for their frequency response.

Teaching. Taught discussion sections for General Physics Mechanics and E&M.

Extracurricular Work & Leadership

Video Game Development — *Portfolio available on website*
Programmer, Game Designer, and Sprite Artist — *2019 - Present*

Carl Sagan Center for Research, SETI Institute — Mountain View, CA
Vice Chair, Astrobiology Group — *May 2018 - May 2020*

Students for the Exploration and Development of Space — Salt Lake City, UT
U. of Utah Chapter Founder and President — *January 2014 - May 2015*

Conference for Undergraduate Women in Physics — Salt Lake City, UT
Conference Organizer — *January 2013 - January 2014*

Society of Physics Students — Salt Lake City, UT
U. of Utah Chapter President and Historian — *October 2010 - December 2014*

University of Utah — Salt Lake City, UT
Telescope Operator and Tour Guide to the Night Sky — *October 2010 - May 2015*

Education

University of Utah — Salt Lake City, UT
Physics B.S., Applied Mathematics B.S., and Astronomy minor — *2015*

Skills and Tools

Computer Languages. C++, Python, PLEXIL, GDScript, C#
Software. ROS, Gazebo, Godot Game Engine, Unity Game Engine, Unix, Git, Jira, GNU Debugger, Aseprite, Blender
Science and Engineering. Computational physics, gameplay programming, space mission design, autonomous systems

Awards

NASA Group Achievement Award (x2) — Moffett Field, CA
Atacama Rover Astrobiology Drilling Studies and Life-detection Mars Analog Project — *September 28th, 2022*

Science Hack Day — San Francisco, CA
Best Interactive Hack — *October 20th, 2019*

Publications

Stucky, Thomas, Diana Gentry, Jessica E. Koehne, David Mauro, Annmarie Schramm. *Investigation of Statistical Classification to Inform Life Detection Mission Evaluation*. Poster for Astrobiology Science Conference. 2019 June 24-28. Seattle, WA.

Stucky, Thomas, Dean Bergman, Brian Glass, Arwen Davé. *Autonomous Regolith Extraction Using Realtime Diagnostics and Dynamic Plan Execution for 1 Meter Class Interplanetary Rotary-Percussive Drills*. Conference paper for ASCE Earth & Space Conference. 2018 April 9-12. Cleveland, OH.

Glass, Brian, Alfonso Davila, William Brinckerhoff, Kris Zacny, Dean Bergman, Thomas Stucky, Christopher Zacny. *Atacama Rover Astrobiology Drilling Studies Project: Second Year*. Conference paper for ASCE Earth & Space Conference. 2018 April 9-12. Cleveland, OH.

Davé, Arwen, Mary Beth Willhelm, Thomas Stucky, Padraig Furlong, Kathryn Bywaters, Grian Glass, Dean Bergman, Jon Rask. *What the Atacama Can Tell Us About Subsurface Mars*. Conference paper for ASCE Earth & Space Conference. 2018 April 9-12. Cleveland, OH.

Benton, J, David Smith, John Kaneshige, Leslie Keely, Thomas Stucky. *CHAP-E: A Plan Execution Assistant for Pilots*. Conference paper for ICAPS. 2018 June 24-29. Delth, Netherlands.

Cianciara, Aleksander J., Christopher J. Anderson, Xuelei Chen, Zhiping Chen, Jingchao Geng, Jixia Li, Chao Liu, Tao Liu, Wing Lu, Jeffrey B. Peterson, Huli Shi, Catherine N. Steffel, Albert Stebbins, Thomas Stucky, Shijie Sun, Peter T. Timbie, Yougang Wang, Fengquan Wu, Juyong Zhang. *Simulation and Testing of a Linear Array of Modified Four-Square Feed Antennas for the Tianlai Cylindrical Radio Telescope*. Journal of Astronomical Instrumentation. 6.2 (2017). Print.

Bergman, Dean, Brian Glass, Thomas Stucky, Kris Zacny, Gale Paulsen, Christopher McKay. *Autonomous Structural Health Monitoring Techniques for the Icebreaker Drill*. Conference paper for ASCE Earth & Space Conference. 2016 April 11-15. Orlando, FL.

Stucky, Thomas R., and Orest Symko. *Ultrasonic Energy Converters*. Talk given at Undergraduate Research Symposium. 2014 Mar 31. Salt Lake City, UT.

Stucky, Thomas R., and Peter T. Timbie. *Simulations of 21-cm Intensity Mapping Observations of Baryon Acoustic Oscillations*. Poster for Rocky Mountain Conference for Undergraduate Women in Physics. 2014 Jan 18. Salt Lake City, UT.

Stucky, Thomas R., and Peter T. Timbie. *Simulations of 21-cm Intensity Mapping Observations of Baryon Acoustic Oscillations*. Poster session presented at 223rd American Astronomical Society meeting. 2014 Jan 7. Washington, D.C.

Stucky, Thomas R., and Orest Symko. *Development of Piezoelectric Devices for Thermoacoustic Engines*. Poster for at Rocky Mountain Conference for Undergraduate Women in Physics. 2013 Jan 19. Golden, CO.