Lux Miranda

(they/she)

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CV current as of 15 April 2022

Education

2020-2022 (expected) **Master of Science in Industrial Engineering**
University of Central Florida (UCF), *Orlando, Florida, USA*
Thesis title: *Humans in algorithms, algorithms in humans: Understanding cooperation and creating social AI with causal generative models*
Final examination 7 April 2022

2016-2020 **Bachelor of Science with University Honors, double-major in computational Mathematics and Computer Science, minor in Anthropology, *Cum Laude***
Utah State University (USU), *Logan, Utah, USA*
Honors thesis: *Computationally revealing recurrent social formations and their evolutionary trajectories*

Supplemental Courses

January 2021 **Agent-Based Modeling of Social-Ecological Systems**, *CoMSES Net International Winter School*, Arizona State University

Publications

2022 (Submitted) Freeman, J., Baggio, J., **Miranda, L.**, & Anderies, J.M. (2021). Kinship moderates energy use in human polities. Submitted to *Proceedings on the National Academy of Sciences (PNAS)*.

2022 (In press) **Miranda L.** & Garibay O.O. (2022). Approaching (Super)Human Intent Recognition in Stag Hunt with the Naïve Utility Calculus Generative Model. In press for a special issue of *Computational and Mathematical Organization Theory*.

2022 Bird, D., **Miranda, L.**, Vander Linden, M. et al. (2022). p3k14c, a synthetic global database of archaeological radiocarbon dates. *Scientific Data* 9, 27 (2022). https://doi.org/10.1038/s41597-022-01118-7

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2021 Awarded *Best Human-Autonomy Teaming Paper*

Miranda L. & Garibay O.O. (2021). Multi-agent Naïve Utility Calculus: Intent Recognition in the Stag-Hunt Game. In: Thomson R., Hussain M.N., Dancy C., Pyke A. (eds) Social, Cultural, and Behavioral Modeling. SBP-BRiMS 2021. Lecture Notes in Computer Science, vol 12720. Springer, Cham. https://doi.org/10.1007/978-3-030-80387-2_32

2020 **Miranda, L.** & Freeman, J. (2020). The two types of society: Computationally revealing recurrent social formations and their evolutionary trajectories. *PLoS One* 15(5): e0232609. https://doi.org/10.1371/journal.pone.0232609

Presentations

10 June 2021 — Evolutionary model discovery of behavioral factors driving decision-making in an irrigation experiment. *Inverse Generative Social Science (iGSS) Workshop 2021.* https://youtu.be/Z7zmaHVSHdc

Research Experience

August 2020 - May 2022 (4 semesters) — **Graduate Research Assistant.** *University of Central Florida Human-Centered Artificial Intelligence Research Laboratory & Complex Adaptive Systems Laboratory.* I have served the full duties of a Graduate Research Assistant every semester of my program.

August 2019 - August 2020 (1 year) — **Undergraduate Research Assistant.** *Utah State University Anthropology Program.* As part of an international archaeological working group known as PEOPLE 3000, I helped to create and manage a new radiocarbon database larger and more complete than any other. I also worked to program and test an online social experiment studying cooperation in a common-pool resource management scenario.

Summer 2019 — **Peak Summer Research Fellow.** *Utah State University.* One of ten recipients awarded a $4,000 USD fellowship for highly-engaged undergraduate researchers to conduct work on a proposed project over the summer. The research conducted under this fellowship produced my first publication, listed above.

Summer 2018 — **NASA Space Grant Consortium Fellow.** Awarded a $1,600 USD fellowship to continue work on a CubeSat mission as the software team leader for the USU Get Away Special Microgravity Research team. Managed a team of ten other programmers. Wrote software for a prototype platform that successfully served over a dozen high-altitude balloon flights. The project (GASPACS) was successfully launched to the International Space Station as part of the SpaceX CRS-24 mission and deployed into low Earth orbit on 26 January 2022.

Teaching Experience

August 2020 - May 2022 (4 semesters) — **Graduate Teaching Assistant.** *University of Central Florida Data Analytics MS Program.* I have served as a GTA for the following courses:

Spring 2022	STA 5206	Statistical Analysis
Fall 2021	STA 5206	Statistical Analysis
Spring 2021	STA 5703	Data Mining Methodology
Fall 2020	COP 6526	Parallel and Cloud Computing

January 2018 - May 2019 (3 semesters) — **Assistant Lecturer / Recitation Instructor.** *Utah State University Department of Mathematics and Statistics.* Worked as an assistant lecturer / recitation instructor for the Differential Equations and Linear Algebra course at USU. Gave original lectures twice-weekly alternating with thrice-weekly lectures by the primary lecturer. Held office hours, created numerous course materials, and designed exam questions.

August 2016 - May 2017 (2 semesters) **Computer Science Tutor.** *Utah State University Department of Computer Science.* Tutored students in introductory computer science courses. Primarily assisted with homework concepts and code debugging.

Industry Experience

May 2017 - Oct 2017 (6 months) **Embedded Engineering Assistant.** *Space Dynamics Laboratory,* Logan, Utah, USA. Developed software for embedded systems in C++. Built a technology demo showcasing a multi-agent platform which toured the USA to help garner funding. Developed, documented, and standardized methods for in-house Linux distribution management that continued to be used after my departure.

Scholarships

November 2021 - August 2022 **PAGES Data Stewardship Scholarship.** Received a $4,400 USD scholarship from PAGES (Past Global Changes) to continue stewardship work on the p3k14c archaeological radiocarbon database as part of the PEOPLE 3,000 working group.

Summer 2018 **Honors Study Abroad Scholarship.** Received a $1,000 USD scholarship from the USU Honors Program to use towards a semester studying historical European art and theatre in Italy, Switzerland, France, and the UK.

2016-2020 **Daniels Scholarship.** Received the full-ride Daniels Scholarship (final award amount: $58,136 USD) to attend any four-year Bachelor's program in the USA for demonstrating exceptional leadership ability, strength of character, and commitment to community betterment. I was required to keep the Daniels Scholar Code of Conduct and work a paid position for at least ten hours per week during every semester to maintain the scholarship.

Awards

July 2021 **Best Human-Autonomy Teaming Paper.** Social, Cultural, and Behavioral Modeling. *SBP-BRiMS 2021*.

Spring 2018 **Outstanding Undergraduate Oral Presentation** in the discipline of Life Sciences, presented on Aleut population modelling project listed below. USU Student Research Symposium.

Fall 2017 **First-place Hackathon Prize.** Led a team of 3 other programmers over the span of just 36 hours to create Will A.I. Shakespeare, a natural language program that procedurally generates Shakespearean sonnets. The project won first place at the largest Hackathon in Utah, *HackUSU.*

Undergraduate Research Projects & Presentations

Fall 2018 **"Optimized Development of a Mars Energy Infrastructure"** Developed a machine learning method that optimizes the shipment of renewable energy infrastructure to Mars in a manner that ensures the sustainment of a large human settlement. Cumulative project of *CS 5810 Machine Intelligence in Clean Energy*. Presented in a departmental symposium.

2017-2018 **"Mathematically Predicting Aleut Population using Archaeological Data"**
Constructed a dynamical model of human-resource interaction to explain historical population changes among the Aleut of the southern Alaskan peninsula. Presented to Utah state legislators in Salt Lake City, Utah, as part of *Research on Capitol Hill*. Available via USU Digital Commons.

Spring 2017 **"OpenSPA: an Open-Source Software Solution for University SmallSat Teams"**
Developed an open-source command-and-data-handling software for embedded satellite systems targeted towards the needs and ability of undergraduate space engineering teams. Presented project at the USU Student Research Symposium. Available via USU Digital Commons.

Undergraduate Extracurricular Organizations

Summer 2016 to Spring 2019 (3 years) **USU Get Away Special Microgravity Research Team**. Worked on a long-running CubeSat mission as part of an all-undergraduate research team. Received NASA fellowship listed above. Managed a team of ten other programmers. Wrote software for a prototype platform that successfully served over a dozen high-altitude balloon flights. The project (GASPACS) was successfully launched to the International Space Station as part of the SpaceX CRS-24 mission and deployed into low Earth orbit on 26 January 2022.

Fall 2017 to Spring 2019 (4 semesters) **Society of Women Engineers (SWE), USU student chapter**. Served as the society Treasurer. Budgeted and managed a financial account with a balance that regularly exceeded $20,000 USD . Successfully presented to donor organizations to secure additional grants. Money was used to fund K-12 STEM outreach to girls, professional development for club members, and promoting diversity in engineering. Volunteered numerous hours to outreach.

Fall 2016 to Spring 2018 (4 semesters) **American Institute of Aeronautics and Astronautics (AIAA), USU student chapter**. Served as society President during the 2017-2018 academic year and as Vice-President during the 2016-2017 academic year. Coordinated all club activities, including K-12 STEM outreach, professional development events, fundraising efforts, and social activities.

Spring 2018 **USU Competitive Rocketry Team.** Rocket targeted the 3,000m altitude mark. Prevented a test-flight after discovering a fatal design flaw in the air brake system. Modeled and optimized the brake system; parts were re-machined based on my specifications. Built/programmed the flight computer, and successfully provided remote troubleshooting to fix an issue with the computer at a critical time during the Spaceport America Cup competition.

Skills

Programming Python (plus pandas, numpy, scipy, matplotlib), NetLogo, JavaScript, Haskell, C++

Software Linux, Git, Vim, LaTeX, Excel

Languages English (native; CEFR level C2), Swedish (intermediate; CEFR level B1)

Cooking Mesoamerican, Vegan Pastries, Hot Beverages