Yahriel Salinas-Reyes

✉ yahrielsreyes@gmail.com 📞 (515)314-4160 📍 1709 E Walnut St, Des Moines, IA, 50316

09/14/23

To Whom It May Concern

Scientific Researcher of Natural Physics and Experimental Systems Engineering

Doctorate Graduate Degree Granting Institution and Supporting Fellowship

To whom it may concern,

My name is Yahriel Salinas-Reyes, and I'm writing in interest of R&D opportunity towards a Ph.D. with your fellowship/institution. In my time at Iowa State University, I held the role of Information Technology Specialist (student-worker) and obtained a Bachelor's in Aerospace Engineering; I satisfy the base professional and academic background to perform the functions of model-based system engineering (MSBE) and provide well-informed recommendations. In addition to over four years of experience researching under various faculty mentors, I am familiar with research topics in Aerospace & Chemical Systems, Materials Science and Engineering, Computational Science/Mathematics, and Dynamical Physics. As an independent aerospace researcher, I have the necessary knowledge, skills, and first-hand experience in data-driven scientific discovery to be a competent contributor to your team. Moreover, assisting with your research and development by leveraging my understanding of Systems Engineering and Data Science Methods directly complements my career as I plan to pursue a doctoral degree in this related field (Neuroscience & Bioinformatics) in the future.

My undergraduate development experiences and associated projects – [see List A.] – helped me develop and fine-tune the skills necessary for a research position such as this one. I have developed research soft skills such as scientific literature review, grant proposal and report writing, and scientific peer-review. Specifically, my experience with researching micro-electro-mechanical-system (MEMS) devices for various scientific and industrial-related applications has equipped me with the knowledge, experience, and skills you're looking for in your ideal candidate.

My inter-disciplinary experience and research approach also equips me with various engineering and research techniques to tackle challenges such as building safety-enhancing technology; analyzing utility of a design or system; applying computational techniques and implementing optimization decisions; as well as developing high-efficiency (i.e., performance/cost) green technologies to challenge overly – complex and expensive – practices. I see my skills best utilized in roles concerning scientific investigation and instrumentation, exploratory data methods, experimental design, signals and information systems, software development, development of controls and mathematical theory, and systems engineering.

On the technical side, I have extensive experience working with various software's and analysis tools, namely MATLAB, Python, Java, C++, Linux, Latex, Solidworks Modeling, ANSYS Simulations, Machine Learning and Data-Statistical Methods, Computational Fluid Dynamics, Signals and Systems (Control Systems) and Deep Learning topics. These skills, in supplement with the theoretical knowledge that I've gained, were honed throughout many completed projects; I am confident in this aspect of research assistantship or consultation.

Through my prior projects projects – [see List A.] – I've learnt how to manage my work in a collaborative environment. Furthermore, I understand the intricacies of research work. I can maintain focus on my individual tasks, with full knowledge of how they contribute to the overall research goals, no matter how mundane and repetitive my tasks are.

I look forward to discussing my candidacy with you virtually. If any additional information will help move my application forward, please let me know. Thanks for your time and consideration.

Sincerely,

- Yahriel Salinas-Reyes

List A.:

Research Activities	*Associations*
- MEMS Shear Sensor and Flow Separation Theory, funded by DARPA	- Microscale Interfacial Fluid Physics Laboratory
- Energy Absorbing Nano-Architected Composites, funded by SFP Programs	- Julia R. Greer Group at CALTECH
- Wind Energy and Development of MEMS Sensors, funded by Boeing	- Boeing Aerospace Research Fellowship
- Implementation of ML into The Scientific Method, funded by SFP Programs	- Z Energy Lab at Stanford University
- Applications of Multi-functional Piezo-electric Devices, funded by NSF	- Goldwater Finalist/McNair Program at ISU
- Opportunities of Kirigami-Inspired MEMS Devices, funded by NSF	- Soft Materials Matter Transport Group
- Heat-Free Manufacturing of Paper-Based MEMS Sensor, funded by ISU Honors	- Iowa State University Honors Program

Yahriel Salinas-Reyes

▫ yahrielsreyes@gmail.com ▫ (515)314-4160 ▫ https://bit.ly/2ZHdQjT

Education: **Iowa State University of Science & Technology, Ames, IA | Bachelor's of Aerospace Engineering '23**

Senior Capstone Project | Iowa State University of Science & Technology | 12/2022-11/2023

Description: Fundamental principles used in engineering design of aircraft, missile, and space systems. Preliminary design of aerospace vehicles. Engineering Ethics.

Target Objective: "Modern Design Methodology with Aerospace Application & Design of Aerospace Systems"

- Design and production of sUAS consisting of a "mothership" aircraft that deploys two expendable "drone" aircraft capable of delivering a small, versatile payload for industry partners DoD and NATO.
- Implemented machine vision systems, industrial controls, automatic identification & data capture, and responsible for providing data-driven decisions as the signals & control systems/electronics lead.
- Utilized systems engineering and aerospace techniques to optimize aircraft design features, dynamic & static stability, and aerodynamic performance of the small, unmanned aircraft system (sUAS).

Learning Outcomes: Upon completion, the individual will have reliably demonstrated the ability to:

- Apply the engineering design process with regards to aerospace vehicles.
- Utilize necessary tools in the engineering design process including computer modeling/simulation and experimentation to help develop the design.
- Function effectively on a small team by establishing leaders and member roles, project goals, and a timeline all in a collaborative and inclusive setting.
- Communicate effectively in formal and informal settings through written and/or oral means.

Relevant Topics and Courses/Curriculum

- Thermodynamics, Flight Dynamics & Controls, Astro-aeronautics, Aerospace & Propulsion Systems

- Applied Mechanics & Physics, Materials Science & Engineering, Engineering & Polymeric Chemistry

- Numerical & Graphical Techniques, Advanced Computing, Engineering Statistics, Multi-Variable Calculus

- Classical Physics, Mechanics of Materials, Engineering Statics, Dynamics & Differential Equations

- Machine-Learning/Data-Science, Computer Science & Information Tech. Systems, Software Engineering

- Technical Communication & Proposal Writing, Scientific Manuscript Writing, Literary Analysis & Review

Relevant Software Experience and Technical Skills

- SQL, Windows OS, Linux OS, AWS Services, Java, C/C++/C# Programming, Python, MATLAB & Simulink, SAS

- CAD & FEA, ANSYS/ABAQUS, Systems & Reverse Engineering, Internet of Things, Design of Experiments

Research and Development Experience

Undergraduate Research Assistant | DARPA - Microscale & Interfacial Fluid Physics Lab | 08/2021-08/2023

Faculty mentor Dr. Thomas Ward II, Associate Professor, Department of Aerospace Engineering, ISU

- Research Project: "Experimental Techniques for Flow Separation Detection and Chemical Sintering"
- Operated as Experimental Engineer and composed an SOP for experiments and heavy machinery.
- Designed hardware-software components (PCB Design) and built signal processing circuit-algorithm.
- Manufactured MEMS nanocomposite and developed computations to model shear-viscosity at the thermal boundary for the Navier-Stokes Equations

California Institute of Technology Summer Undergraduate Research Fellow | Greer Group | 05/2022-08/2022

Faculty mentor Dr. Julia Greer, Assoc. Prof. of Materials Science, A. Mechanics, & Medical Sciences, Caltech

- Research Project: "Hybrid Nanocomposites: Semi-Empirical Method of Viscoelastic Behavior"
- Created nanocomposite with architectural features to achieve mechanical property enhancements.
- Investigated the constituent material systems individually using compressions tests on a dynamic mechanical analyzer and observed deformation zones with scanning electron microscopy.
- Developed a semi-empirical model for the deformation mechanisms observed in post-mortem analysis of samples; this enables FEA & Euler Theory to inform the viscoelastic continuum damage model.

McNair Scholar | Ronald E. McNair Post-Baccalaureate Achievement Program | 09/2021-05/2022

Faculty mentor Dr. Ashley Garrin, Director of Ronald E. McNair Program, Graduate College, ISU

- Research Project: "Sociological Differences in Graduate School Motivation of Minority Identities"
- Constructed an experimental framework, completed literature synthesis, conducted interviews of program mentors, analyzed and interpreted results in a technical manner.
- Participated in preparation courses and experiences for **doctoral studies** through involvement in research and other scholarly activities.

Undergraduate Researcher, Systems Engineer | Soft Matter Material Transport Group | 08/2019-05/2022

Faculty mentor Dr. Martin Thuo, Associate Professor, Department of Materials Science and Engineering, ISU

- Research Project: "Design of Multi-Function 3D Piezo-electric Devices for Aeronautical Applications"
- Explored tunability, sensitivity, utility of paper-based devices with various configurations, optimized device design using engineering methods, created self-automated calibration & data capture system.
- Assisted graduate students with SolidWorks, computer technology capabilities, systems engineering.
- ***This research work was submitted to a scientific peer-review journal for publication(2023)***.

Research Fellow | Boeing Undergraduate Research Excellence in Engineering Internship | 08/2021-08/2022

Faculty mentor Dr. Thomas Ward II, Associate Professor, Department of Aerospace Engineering, ISU

- Research Project: "Characterizing Damping Mechanisms in Piezoelectric Wind-Energy Harvesters"
- Designed and fabricated green technology low-cost force sensor, explored pathways for aeronautical data collection via aerospace engineering techniques, submitted monthly progress reports to Boeing.
- ***This research work was submitted to a scientific peer-review journal for publication(2023)***.

Stanford University Summer Undergraduate Research Fellow | Zheng Research Group | 05/2021-08/2021

Faculty mentor Dr. Xiaolin Zheng, Associate Professor, Mechanical Engineering, Stanford University

- Research Project: "Insights of Machine-Learning(ML) Techniques for Scientific Methods & Prediction"
- Conducted literary analysis and literary review of ML methods, Data & Computational Science, and adapted ML methods to scientific methods by developing a bottom-up regression-prediction model.
- Cross-validated various mathematical-kernels(SVM, Random-Forest, etc.) fitted/trained with scientific datums; presented findings in optimizations of experimental design for scientific discovery.

Undergraduate Research Certificate Recipient |IINSPIRE-LSAMP(NSF) Scholars Program| 08/2019-09/2020

Faculty mentor Dr. Martin Thuo, Associate Professor, Department of Materials Science and Engineering, ISU

- Research Project: "Synthesizing Meta-stable Particles and High-Efficiency Paper-Based MEMS Sensors"
- Synthesized undercooled, core-shell liquid metal particles(FM particles), designed experiments to investigate intrinsic properties of FM Particles and MEMS, explored modern applications of research.
- Prepared literary review of current state of sensor technology, did deep literary analysis of relevant science engineering research, produced adaptations of MEMS designs to fulfil gaps in research field, presented ideation of low-cost, green technology, sensor devices for industry and social impact.

Additional Professional and Leadership Experiences

Design Team Lead |NASA Micro-G Neutral Buoyancy Experiment Design Teams Challenge |08/2021-12/2022

- Completed and assigned weekly tasks to design, build, and test a tool or device that addresses an authentic, current space exploration challenge; specifically, Extravehicular activity(EVA).
- Completed research in current technologies and lead: prototyping of device components; CAD modeling & reverse engineering; building of prototype; and submitted proposal to competition.
- ***Our design was utilized by astronaut-scientists in NASA's Mission to the Moon and Mars and displayed at the Houston exhibition – Inner Space: NASA's Path to the Moon and Mars(2022)!***

Information Technology Specialist | Iowa State University of Science & Technology | 08/2019-05/2023

- Held responsibilities for the implementation, monitoring, and maintenance of IT computer systems.
- Solved technical problems: computer systems, software, hardware, networks, cloud platforms, etc.
- Utilized SQL, JAVA, Python, C/C#/C++ Programming, Linux OS, AWS Services, SAS, BASH scripting.

Community Engagement, Public Relations & Policy, and Social Work

Residential Advisor and Honors Community Leader | Department of Residence | 08/2020-05/2022

- Engaged students & nurtured healthy-positive experiences for the resident community; moderated meetings to address concerns; directed multi-lingual health & resource programming for college.

Youth-Lobbyist |Iowa Department of Human Rights: State of Iowa Youth Advisory Council | 06/2018-12/2021

- Acted as chair/program-coordinator of the Violence-Prevention & Diversity-Education Program.
- Advocated to state legislators for reformation of violence prevention education & implementation of culturally diverse curriculum standards at the state-local level; wrote & proposed bills to chamber.
- ***Received the Community Service Leadership Award for completing over 200 service hours in a term.***

Stewardship and Service

Community Leader & Multi-lingual Ambassador/Educator | CultureAll Educational Nonprofit | Fall 2023

- Assisted in organizing events to engage local educators and institutional leaders at the state and local level, provided developmental and networking opportunities for young professionals, volunteered at local events to provide diversity education to communities or groups in need.

Community Honors Leader | Iowa State University Honors Program | Fall 2020-Spring 2022

- Provided professional and research development resources to the Honors Program and its honors students, acted as mentor to honors students while the Honors Residential Advisor.

Coordinator of Violence Prevention & Educational Coverage | Iowa Non-Profits | Spring 2020-Summer 2020

- Utilized skills and experience in community social work to lead interns in creating mental health resources/content in multiple languages; distributed resources and content to local youth of color during the pandemic and rise in violence of 2020.

Latinx Forum Panelist & Multi-lingual Advocate | Association of Iowa Latinx Professionals | Fall 2020

- Shared my professional experience and pathway as a First-Generation College Student, answered questions about professional development and experiences, provided personal developmental content and resources for Latinx leaders.

Workshop Presenter | National White Privilege Conference | Spring 2020

- Developed and presented a workshop "How to engage students of color in higher education" at the White Privilege Conference to national leaders to share my knowledge and resources.

Honors, Awards, and Membership

- University Honors Program Member | Fall 2019-Fall 2023
- Ronald E. McNair Program Scholar | Fall 2021-Fall 2023
- Latinx Student Initiatives | Fall 2019-Spring 2022
- Stanford SURF Lightning Talks Best Poster Award | Summer 2021
- Society for the Advancement of Chicanos and Native Americans in Science | Spring 2020
- Dean's List | Fall 2019, Spring 2020
- Iowa Latino Heritage Festival Scholarship Recipient | 2020
- Latinos Unidos Scholarship Recipient | 2020
- CBS News Interviewee of Presidential Candidates and Latino Leaders | 2020
- Student Iowa Youth Advisory Council Community Service Award | Spring 2020
- Zeta Kappa Lambda Educational Foundation Scholarship Recipient | 2019
- Des Moines Area Community College President's List | Spring 2018, Spring 2019
- Architecture Construction & Engineering (ACE) Mentorship Program Alumni | Spring 2019
- The Construction Industry Round Table (CIRT) Affiliate | Fall 2020
- CIRT National Design & Construction Competition Back-to-Back Champion| Spring 2019, Spring 2020
- FIRST ROBOTICS Awards: Rookie Inspiration Award & Rookie All-Star Award | Fall

Research Presentations and Scientific Thematic Talks

1. Y. Salinas-Reyes, H. Seabold, A. Martin, M. Thuo (2020, April). Exploring the Piezoresistive Effect and Paper-based MEMS Sensors. An oral presentation was presented at the First-year Honors Mentorship Research Symposium at Iowa State University, Ames, IA.
2. Y. Salinas-Reyes, A. Martin, M. Thuo (2020, August). Integration of paper-based MEMS sensors into computer technology. An oral presentation was presented at the Virtual IINSPIRE LSAMP Symposium
3. Y. Salinas-Reyes, A. Martin, M. Thuo (2020, October). Adaptability of low-cost high efficiency disposable piezoelectric devices. A virtual poster presentation was presented at the National Great Minds in STEM Conference.
4. Y. Salinas-Reyes, A. Martin, M. Thuo (2021, April). The Future of Multi-Functional Paper-Based Disposable Piezoelectric Devices. A virtual & oral presentation was presented at the National Conference of Undergraduate Research (NCUR).
5. Y. Salinas-Reyes, X. Zheng (2021, August). Predicting Olympic Triathlon Results via Machine Learning. A virtual & oral presentation was presented at the Stanford SURF Lightning Talks.
6. Y. Salinas-Reyes, Julia R. Greer (2022, August). Energy Absorption in Nano-Architected Hybrid Composites. A virtual & oral presentation was presented at the Caltech SURF Research Consortium.
7. Y. Salinas-Reyes, Ivaldi Co. (2022, May). Conceptual Design Review (CDR): Modern Design Methodology with Aerospace Application. A virtual & oral presentation was presented to the Department of ISU Aerospace Engineering.
8. Y. Salinas-Reyes, T. Ward III (2022, May). Shear-Sensing Principals of Interfacial Viscous-Shear Flow and Piezomobility—strain-induced mobility—at The Wall (Thermal Boundary). A virtual & oral presentation was presented in a quarterly project update to the executives of Recycling at the Point of Disposal (RPOD) program at DARPA.
9. Y. Salinas-Reyes, T. Ward III (2023, July). Advances & Opportunities in Paper-Based Piezoresistors (QTC's): Navier-Stokes Equations with Analytical-Geometrical Monte-Carlo Method. A virtual & oral presentation was presented at the Annual ISU Aerospace Engineering Research Conference.
10. Y. Salinas-Reyes, T. Ward III (2023, August). Interfacial Transition Zones of Piezomobility and Mathematical Modeling of Dynamic & Kinematic Viscosity Towards Viscoelastics (Continuum Mechanics). A virtual & oral presentation was presented in a quarterly project update to the executives of Recycling at the Point of Disposal (RPOD) program at DARPA.
11. Y. Salinas-Reyes, Ivaldi Co. (2023, September). Executive and Granter Design Sign-Off: Design of Aerospace Systems (i.e., sUAS). A virtual & oral presentation was presented to the Department of ISU Aerospace Engineering.