

# Yahriel Salinas-Reyes | B.Sc. Aerospace Engineering Computational (Software) Engineer & Research Data Scientist The GEM Consortium, Ph.D. Engineering and Science Fellowship

Polk: Des Moines, 50316, Iowa, United States

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Date: 07/08/2024

Hiring Committee

Warszawa, Mazowieckie, Poland

Inquiring about the Principal Data Engineer Position

Dear Review Committee,

I am writing to express my enthusiastic interest in the Principal Data Engineer position at Bayer Crop Science IT. With a solid foundation in applied science and technology research, and deep expertise in data engineering, I am eager to contribute to your team's mission of driving innovation in agriculture.

My qualifications align closely with your requirements for a Principal Data Engineer. I bring extensive experience in backend data services, pipeline construction, and platform development, skills honed through my role as a Scientist I & Data Engineer at Bayer Crop Science R&D Regulatory Science Toxicology Group. Here, I led initiatives integrating advanced technologies to enhance regulatory compliance and data-driven decision-making.

I am proficient in the Go programming language and well-versed in architectural patterns such as microservices and event-driven architecture. My experience with API protocols like gRPC, JSON over HTTP, and GraphQL, along with proficiency in containerized applications and Kubernetes, positions me well to contribute to your technical strategy and solution design efforts.

Beyond technical skills, I have a proven track record of collaborating effectively across teams to deliver innovative solutions. My ability to communicate complex technical principles to stakeholders and mentor junior engineers underscores my commitment to technical excellence and team development.

I am excited about the opportunity to bring my skills and passion for innovation to Bayer Crop Science. I am eager to discuss how my background in data engineering and regulatory compliance aligns with your organization's goals. Thank you for considering my application. Please feel free to contact me at [(515)314-4160] or [yahrielsreyes@gmail.com] to schedule a conversation.

Looking Forward to Hearing From You,

**Yahriel Salinas-Reyes**

*Attached: curriculum vitae*

**Computational (Software) Engineer & Research Data Scientist**  
*The GEM Consortium, Ph.D. Engineering and Science Fellowship*

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**Iowa State University of Science & Technology**

**Ames, IA**

2023

Specialized in Nanoscience/materials, Computational & Mathematical Sciences, Theoretical Modeling & Experimental Verification

- o Graduated with a B.Sc. in Aerospace Engineering ('23), I refined a comprehensive research background spanning diverse areas of applied science and technology. My recent transition to the Regulatory Science Affairs domain at Bayer R&D has endowed me with extensive experience in transferring regulatory efficacy data, ensuring alignment with historical documents, assembling regulatory dossiers with bioinformatics and risk assessment data, and leveraging industry operational research techniques. I possess a robust business acumen, to deliver critical insights and recommendations for pipeline decisions, thus bridging the gap between scientific research and strategic business objectives.

- o Programming: Python, R, Linux, .NET, C, C++, C#, Java/JavaScript, HTML/CSS, MATLAB, SQL, GO, AWS
- o Other: Full-stack, Docker (CI/CD Tools), CAD & FEA, ANSYS/ABAQUS, Machine Learning & Deep Learning
- o Tech Stack: Git, Databricks, Bash (Shell) Scripting, Snowflake, TypeScript, Jupyter Notebook (Anaconda), Pycharm

Program	Institution/Board	Year
<i>GEM Ph.D. Fellowship*</i> (Sci.&Eng.)	The National GEM Consortium: <i>Funding confirmed upon admission Ph.D. Program*</i>	2024-2029*
<i>Open/Study Research Award</i> (Finalist)	The Fulbright X National Geographic Award: Bureau of Educational & Cultural Affairs	2024
<i>ACCT Cert.</i> (Order of The Engineer)	Engineering Accreditation Commission of ABET	2023
<i>P.B.C.</i> (McNair Scholars)	Ronald E. McNair Postbaccalaureate Achievement Program	2021-2023
<i>Intern.</i> (Boeing Research Fellowship)	Boeing: Undergraduate Research Excellence in Engineering Fellowship	2021-2022
<i>S.F.P.</i> (SURF Scholars)	Summer Undergraduate Research Fellowship at Stanford Univeristy('21) & Caltech('22)	2021-2022
<i>P.B.C.</i> (Research Certificate)	Louis Stokes Alliances for Minority Participation (LSAMP)	2019-2021

**Bayer Crop Science, Seeds & Traits Safety: R & D Regulatory Science Toxicology Group**      **St Louis, MO**  
*Scientist I & Data Engineer*      *05/2024- Present*

- o Operate in Automation/Deep Learning & provide digital/software solutions aligned with the RAG Pipeline to cross-functional teams in agricultural science and biotechnology, specifically, the Macromolecular Toxicology in the Seeds & Traits Safety Regulatory Science Group at Bayer.
- o Responsible for full-stack development for Regulatory Affairs to consolidate GLP and transference of historical risk assessment data directly to global regulatory agencies before product launch.

Ames. IA

05/2022- 12/2023

- Contributed to efforts in recycling at the point of disposal in direct development (phase I-III of R&D) of computer vision system, flow sensor technology, and experimental methods (validation) in rotating tank experiment to characterize mechano-chemical processes. Contributed to DARPA's mission to recover rare-earth elements from electronic waste.

### **The Microscale & Interfacial Fluid Physics Laboratory**

**Ames, IA**

*Experimental Systems & Automation Engineer*

08/2021- 12/2023

- Demonstrated expertise in experimental systems and automation engineering, contributing to groundbreaking research in fluid mechanics/dynamics and interfacial phenomena. Focused on the design, development, and optimization of experimental apparatus and automation protocols, significantly enhancing research efficiency and data accuracy.

### **The Soft Matter Material Transport Group**

**Ames, IA**

*Undergraduate Researcher & Systems Engineer*

08/2019- 05/2022

- Played a key role in the Soft Matter Material Transport Group's research initiatives, focusing on the design of experiments (DOE) and advanced development (phase II/III) of multi-functional piezoelectric devices for aeronautical applications and renewable energy. Statistical methods showcasing skills in systems engineering and materials science.

### **Caltech The Kavli Nanoscience Institute: The Julia R. Greer Group**

**Pasadena, CA**

*Undergraduate Research Assistant*

05/2022- 08/2022

- Contributed to research efforts at Caltech's Kavli Nanoscience Institute, collaborating with the Julia R. Greer Group on the development of hybrid nanocomposites and the investigation of viscoelastic behavior, highlighting capabilities in nanomaterials synthesis and characterization. Tasked with mathematical modeling and experimental validation

### **Boeing: Wind Energy & Development**

**Ames, IA**

*Boeing Aerospace Research Fellow*

08/2021- 08/2022

- Served as a Boeing Aerospace Research Fellow, spearheading projects in wind energy research and development, with a focus on characterizing damping mechanisms in piezoelectric wind-energy harvesters, demonstrating expertise in aerospace engineering and renewable energy technologies. Produced computational model for energy harvesting.

### **Stanford University: Xiaolin Zheng Z-Energy Group**

**Stanford, CA**

*Undergraduate Research Assistant*

05/2021- 08/2021

- Engaged in research endeavors at Stanford University's Z-Energy Group, investigating the application of machine learning techniques in scientific methodologies and prediction, showcasing proficiency in data-enabled sciences, deep learning methods, and computational modeling in data-driven research. Contributed to scientific communications.

### **Iowa State University of Science & Technology**

**Ames, IA**

*Information Technology Specialist & Data Scientist*

08/2019- 05/2023

- Provided technical expertise and operated in cross-functional teams with effective communication of controlled data, contributing to the implementation, monitoring, and maintenance of IT systems while leveraging data science techniques for analysis and decision-making. Gained experience in full-stack development & CS infrastructure systems.

## **Key Projects within Regulatory Science & Bioinformatics**

### **1. Risk Characterization of Toxicological, Hazardous, and Nutritional Bioinformatic Data** **May 2024 - Present** *Regulatory Science Group in Seeds and Traits Safety Division / (Mentor: Dr. Kimberly Hodge-Bell) Bayer Crop Science*

- Analyzed and interpreted bioinformatic data to assess toxicological, hazardous, and nutritional risks.
- Ensured compliance with global regulatory safety guidance such as the European Food and Safety Agency (EFSA).
- Developed risk characterization models to predict potential safety concerns.
- Collaborated with interdisciplinary teams to enhance data accuracy and reliability.

◦ *Keywords: Toxicology, Hazard Assessment, Nutritional Data, Regulatory Compliance, Bioinformatics*

### **2. Automation of Procedural Systems and Experimental Bioinformatic Data**

**May 2024 - Present**

*GEM Fellow / Crop Field Protection Digital Solutions Automation & Pipeline Design*

*Bayer Crop Science*

- Implemented automation systems for procedural and experimental bioinformatic data management.
- Managed toxicological information and hazardous exposure assessments from field tests and trials.
- Integrated data from internal and external studies to support global clients.
- Enhanced efficiency and accuracy in data collection and processing.

◦ *Keywords: Automation, Bioinformatic Data, Toxicological Information, Exposure Assessments, Data Integration*

### **3. Data Mining and Automation Pipeline Design for Historical Regulatory Responses** **May 2024 - Present**

*GEM Fellow / R & D Regulatory Science Group Digital Solutions Automation & Pipeline Design Bayer Crop Science*

- Designed data mining and automation pipelines to ensure data integrity.
- Analyzed historical regulatory response data for global scientific and food safety agencies.
- Developed systems to support the assembly of dossiers before product launch.
- Improved the accuracy and reliability of regulatory data submissions.
- *Keywords: Data Mining, Automation, Data Integrity, Regulatory Responses, Pipeline Design*

#### **4. Development Operations (DevOps) for Historical Data Transfer and Compliance** **May 2024 - Present** *GEM Fellow / Software & Data Engineering, Regulatory Macromolecular Toxicology Team* *Bayer Crop Science*

- Managed the transference of historical data related to search query data of regulatory responses and submissions.
- Ensured compliance with strict global guidelines and document version management.
- Implemented cybersecurity measures to protect controlled data.
- Streamlined document management processes to enhance efficiency and security.
- *Keywords: DevOps, Data Transfer, Compliance, Document Management, Cybersecurity*

## **Research and Development Projects**

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### **1. Experimental Techniques: Flow Separation & Chemical Sintering** **August 2019 - August 2023** *B.Tech / (Prof: Dr. Martin Thuo, Dr. Thomas Ward)* *Iowa State University of Science & Technology*

- Developed hardware-software components and signal processing circuits for detecting flow instabilities in paper-based MEMS devices.
- Conducted experiments to manufacture MEMS nanocomposites and modeled shear viscosity.
- Aimed to simulate viscosity measurements at the thermal boundary for potential applications in aerospace.
- *Keywords: Systems Analysis, Interfacial Phenomena, Computational Modeling & Analysis, Navier Stokes Equations*

### **2. Damping Mechanisms in Piezoelectric Wind-Energy Harvesters** **August 2021 - August 2022** *Research Fellow / Mentor -(Prof: Dr. Thomas Ward Dept. of Aerospace Engineering, ISU)* *Boeing Aerospace*

- Designed experimental setups and measurement-calibration systems for piezoelectric wind-energy harvesters.
- Collaborated on solution algorithms and continuum mechanics of conductivity to optimize wind-tunnel experiments.
- Objective was to define thermodynamic properties for enhancing wind-energy harvesting efficiency.
- *Keywords: Aerodynamics Analysis, Harmonic Response, Computational Methods, Energy Storage, Soft Matter Physics*

### **3. Energy Absorption in Nano-Architected Hybrid Composites** **May 2022 - August 2022** *Prof: Dr. Julia R. Greer of Materials Science, A. Mechanics, & Medical Sciences Caltech, Kavli Nanoscience Institute*

- Created nanocomposites with architectural features to enhance mechanical properties.
- Investigated deformation mechanisms using dynamic mechanical analysis and scanning electron microscopy.
- Developed a semi-empirical model to understand viscoelastic effects in hybrid nanocomposites.
- *Keywords: Nanoscience, Applied Mathematics, System Modeling, Continuum Mechanics, Energy Dissipation*

### **4. Meta-stable Particles: Phase-change Materials and their Applications** **August 2019 - May 2022** *Prof: Dr. Martin Thuo Dept. of Materials Science and Engineering, ISU* *NSF-LSAMP, NSF Award No. 1757393*

- Conducted research on meta-stable particles and their applications in phase-change materials.
- Collaborated on developing novel materials with unique properties for various industrial applications.
- Investigated the behavior of phase-change materials under different conditions for practical utilization
- *Keywords: Materials Science, Chemical Synthesis, Solid-State Physics, Advanced Materials, Applications*

## **Course Work**

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### **Key Courses** **August 2019-December 2023** *(Fundamentals and Formal Methods)* *Iowa State University: College of Engineering*

- **Courses:** Applied Mechanics & Physics, Materials Science & Engineering, Engineering & Polymeric Chemistry, Engineering Statistics, Machine-Learning/Data-Science, Finite Element Method, Bayesian Methods, Systems Engineering
- **Lab:** Numerical & Graphical Techniques, Advanced Computing/Programming, Advanced Data Structures & Algorithms

## **Online Courses**

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- **Deep Learning/CS:** *Digital System Testing & Testable Design, Theory & Applications of Data Structures and Algorithms* (May 2023), *Deep Learning with PyTorch* (Jan 2022), *Data Analysis with Python/AWS* (Oct 2021)

- o **MathWorks/ML:** *Kernel Methods for Pattern Recognition & Analysis, Data Mining, Machine Learning with Matlab/Python (June 2023), Machine Learning, TensorFlow & Computer Vision with Matlab/Python (May 2022),*

## References

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Reference I: Dr. Martin Thuo  
Professor of Materials Science and Engineering  
North Carolina State University  
911 Partners Way, Room 3002  
Engineering Building I Raleigh NC 27695-7907  
Email: mthuo@ncsu.edu  
Phone: (617)458-2363  
Web:<https://www.mse.ncsu.edu/thuo/>

Reference II: Dr Thomas Ward  
Professor of Mechanical and Aerospace Engineering  
University of Virginia Engineering  
Thornton Hall, 351  
McCormick Road,  
Charlottesville, VA 22904  
Email: hgw8rs@virginia.edu  
Phone: (434) 924-3072

Reference III: Dr. Lequetia Ancar  
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Reference IV: Dr. Julia R. Greer  
Professor of Materials Science, Mechanics, and Medical California Institute of Technology Division of Engineering and Applied Science  
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