TAYAB SOOMRO

Entrepreneur · Computational Biologist · Data Scientist · G20 YEA Delegate

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SKILLS

TECHNICAL

- **Software Development:** Proficient in full-stack development with experience using React, Angular, React Native, and Flask; skilled in setting up and managing AWS services including EC2, RDS, and Lambda functions.
- **Data Analysis:** Advanced proficiency in Python and R for developing custom scripts and automating data processes; experienced in creating dynamic dashboards and reports using PowerBI.
- **Genomics & Bioinformatics:** Genome annotation, assembly, gene prediction, pan-genomics, evolutionary and comparative genomics, RNA-Seq analysis
- **System Architecture:** Expertise in designing and implementing scalable and secure application architectures using Docker, Redis, and Celery for task management and asynchronous operations.

COMMUNICATION & COLLABORATION

- **Stakeholder Engagement:** Strong ability to communicate technical details and project impacts effectively to non-technical stakeholders, enhancing understanding and project buy-in.
- **Team Collaboration:** Experienced in leading cross-functional teams, setting up scrum and stand-up meetings, and maintaining alignment with project goals through JIRA for task management and sprint planning.
- **Presentation Skills:** Proficient in delivering engaging presentations and detailed project reports to senior management, clients, and external stakeholders, using insights and data visualizations to inform and persuade.

PROJECT MANAGEMENT

- **Agile Methodologies:** Skilled in Agile project management, utilizing JIRA to oversee project timelines, deliverables, and resources, ensuring efficient workflows and timely completion of project milestones.
- **Time Management:** Demonstrated ability to manage multiple projects simultaneously, prioritize tasks effectively, and adapt quickly to changing requirements to meet tight deadlines.

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WORK EXPERIENCE

External Supervisor, PLSC 491 Honors Research Project, University of Saskatchewan, 2024 - 2025
Undergraduate Research Supervisor / Thesis Mentor / Research Scientist

- Mentored a student through their undergraduate honours research project, guiding experimental design, data collection, and analysis in plant pathology sciences.
- Provided comprehensive feedback on thesis writing, helping the student develop clear, concise, and well-supported arguments in their research.
- Supervised lab work, ensuring the student followed proper protocols and gained hands-on experience in plant molecular biology techniques and data analysis.

Bioinformatics Consultant, Agriculture & Agri-Food Canada (AAFC), 2024 - Present
Population Genomics Specialist / Genomics Data Scientist / Disease Diagnostics Specialist

- Conducted population genomics studies, focusing on Genome-Wide Association Studies (GWAS) on Vicia faba (faba bean) data, identifying key genetic traits associated with crop resilience and productivity.
- Led the annotation of Aphanomyces genomes, utilizing cutting-edge bioinformatics pipelines to enhance the understanding of pathogenicity and disease resistance mechanisms in agricultural contexts.
- Integrated the Nanopore's Mk1C device in point-of-care diagnostics for the rapid detection of plant and animal pathogens, including *Sclerotinia sclerotiorum* in canola, *Xylella fastidiosa* in grapevines, and veterinary pathogens such as *Brucella abortus i*n bovine samples and *Mycoplasma ovipneumoniae* in ovine populations.
- Provided computational support across diverse research groups within the Agriculture and Agri-Food Canada (AAFC) network, ensuring the efficient use of bioinformatics tools and resources to accelerate research outcomes and improve data-driven decision-making.

Bioinformatics Consultant, University of Saskatchewan, 2022 - Present
IT Support Specialist / Technical Trainer / HPC System Administrator / Bioinformatics Training Specialist

- Developed and led workshops on advanced data analysis and computational techniques using Linux-based environments, focusing on enhancing software development and system optimization skills, which are critical for real-time data processing and analysis.
- Managed high-performance computing (HPC) resources, including job scheduling and resource allocation on AWS cloud platforms, ensuring optimal performance and efficiency in processing large-scale data sets for various computational analyses.
- Conducted comprehensive data interpretation and reporting using Python and R, transforming complex genomic data into actionable insights, streamlining workflows and improving outcomes in epidemiological assessments.
- Designed and implemented comprehensive training programs for graduate students, focusing on the use of Python programming, Linux environments, HPC clusters, and AWS, thereby enhancing their capabilities in data analysis, and computational research methodologies.

Senior Computational Biologist, FoodImprover Inc., 2023
Full-Stack Software Developer / IT Consultant / Data Analyst / Data Engineer / Business Intelligence Developer

- Led the development and implementation of a full-stack web platform using ReactJS and AWS services (including RDS and Lambda functions) to dynamically display the results of complex, multi-dimensional data analyses on agriculturally important traits in apples.
- Conducted advanced data analysis on over 1,000 records with 5,000+ features using Python and R scripts in Jupyter Notebooks, focusing on association mapping to identify key traits, enhancing understanding and decision-making within the agricultural sector.
- Engineered and maintained robust data pipelines and analytics platforms, integrating AWS cloud solutions and automated Python scripting to streamline data processing and ensure high data quality and accessibility for stakeholder review.
- Presented detailed analytical reports and findings to industry stakeholders, utilizing data visualization tools in Jupyter Notebooks to translate complex data sets into actionable insights.

Computational Biologist, NRGene Canada Inc., 2020-2023
Full-Stack Software Developer / Cloud Solutions Architect / DevOps Engineer

- Developed and maintained a highly utilized industry-grade Python library within a 100+ employee organization, implementing rigorous software development practices including sprints, scrum meetings, and code reviews to enhance code efficiency and maintain system uptime.
- Engineered a scalable, AWS-based infrastructure to run complex computational pipelines cost-effectively, leveraging services like AWS RDS, Cognito, and API Gateway, alongside front-end development using the React framework to meet dynamic customer demands.
- Orchestrated the development and deployment of containerized applications using Docker, coupled with Java-based Swagger API for robust backend operations, ensuring seamless, secure, and scalable application performance across platforms.
- Created an automated reporting system using Markdown in R and Python, facilitating real-time data analysis and reporting, and engaged with stakeholders to present findings and iterate developments, contributing to continuously enhancing project outcomes.

Full-Stack Developer (Contractor), Luxsonic Technologies Inc., 2020
Web Developer / Software Project Consultant

- Overhauled and enhanced the MedCast360 web platform developed with Angular for the front end and PHP Laravel for the back end, significantly reducing system bugs and improving application reliability and user experience.
- Engineered and implemented new features and pages within the application, leveraging AWS services such as EC2 and RDS to ensure scalable and robust hosting solutions, enhancing overall service delivery and platform capabilities.
- Independently managed sprint tasks and reported directly to the CTO, setting up and leading scrum meetings to ensure alignment with project goals, gather feedback, and iterate on development strategies effectively.
- Coordinated directly with executive leadership as an independent contractor, demonstrating strong self-management and communication skills while continuously updating and refining application functionalities based on CTO input and user feedback.

Teacher Assistant, University of Saskatchewan & Dalhousie University, 2017 & 2022

- Facilitated computer science and agriculture learning, emphasizing statistical methods and quantitative analysis.

EDUCATION

M.Sc. Agriculture
Dalhousie University (2020 - 2022)
Thesis: Exploring the genetics of aroma production in apples

B.Sc. (Honors) Computer Science & Bioinformatics
University of Saskatchewan (2015 - 2020)
Thesis: Kinome responses of Arabidopsis to clubroot (Plasmodiophora brassicae) infection

COMMUNITY WORK

Canadian Delegate, G20 Young Entrepreneurs Alliance (2024)
Represented Canadian Entrepreneurship at São Paulo, Brazil during the G20 YEA Summit

- The G20 Young Entrepreneurs' Alliance Summit takes place before the G20 Leaders Summit, bringing together some of the most ambitious entrepreneurs from across the globe to draft recommendations for policymakers. I was selected to represent Canada at the G20 Leaders Summit in São Paulo, Brazil.

Senior Data Analyst, Data For Good Regina Chapter (2024)
Business Intelligence Analyst / Strategic Insights Analyst / Community Impact Analyst

- Developed comprehensive data dashboards using PowerBI for the Regina Food Bank, enabling visualization of donation sources, demographic profiles of support seekers, and their financial status to provide stakeholders with deep insights into operational effectiveness.
- Conducted detailed regression analysis to identify trends and patterns in donation data, assisting stakeholders in understanding the impact of their contributions and guiding strategic decision-making for future outreach and resource allocation.
- Collaborated with non-profit leaders to define data requirements and tailor analytics solutions, ensuring the delivery of actionable insights that support program evaluation and enhance organizational impact.
- Led stakeholder meetings to present data-driven insights and reports, facilitating informed discussions on program improvements and community engagement strategies based on robust analysis of donor activities and beneficiary demographics.

Judge, Regional Science Fairs (2020-2023)

- Promoted innovation and collaboration by assessing science projects, aligning with research and community development commitment.

GRANTS & AWARDS

- **StartupTNT Fund**, ($100,000), StartupTNT Summit X Finale Winner, 2024
- **AgTech Growth Fund**, R&D funding for AgTech business idea, ($75,000), Innovation Saskatchewan, 2024
- **Opus Startup Fund**, Startup funding for PathoScan, ($3,500), University of Saskatchewan, 2023-2024
- **Global Innovation Challenge,** 1st Place ($8,600), Heriot-Watt University, 2023
- **24-hour Startup Hackathon**, 1st Place ($9000), Canada Farm Show, Regina, 2023
- **CoHack Hackathon**, 1st Place ($3,000), CoLabs, Saskatoon, 2022
- **Med.Hack(+) Hackathon**, 1st Place, Saskatoon, 2022
- **Ag Hackathon,** 1st Place, Emerging Agriculture, 2019
- **Undergraduate Research Assistantship (USRA)**, Dept. of Computer Science, U of S, 2018
- **Programming Contest**, 1st Place, Dept. of Computer Science, U of S

HIGHLIGHTED PUBLICATIONS

- Soomro T, Jordan M, Watts S, Migicovsky Z, Forney C, Song J, Myles S. (2023). **Genomic insights into apple aroma diversity**. Fruit Research. https://doi.org/10.48130/FruRes-2023-0027
- Obshta O, Zabrodski MW, Soomro T, Wilson G, Masood F, Thebeau J, Silva MCB, Biganski S, Kozii IV, Koziy RV, Raza MF, Jose MS, Simko E, Wood SC. (2023). **Oxytetracycline-resistant Paenibacillus larvae identified in commercial beekeeping operations in Saskatchewan using pooled honey sampling**. Journal of Veterinary Diagnostic Investigation. https://doi.org/10.1177/10406387231200178
- Soomro T, Watts S, Migicovsky Z, Myles S. (2022). **Cider and dessert apples: what's the difference?** Plants, People & Planet. https://doi.org/10.1002/ppp3.10284

HIGHLIGHTED SOFTWARE DEVELOPMENT PROJECTS

- **ORHuddle** - Operating Room Management Software
    - Collaborated closely with a urologist surgeon to design and develop ORHuddle, a React Native mobile application aimed at improving communication and operational efficiency in operating rooms, significantly enhancing surgical outcomes.
    - Engineered the backend of the application using AWS RDS, ensuring robust, scalable, and secure data storage solutions that supported real-time data access and high availability across clinical settings.
    - Presented and demonstrated the ORHuddle application to key decision-makers at the Saskatchewan Health Authority (SHA), effectively communicating the app's features, benefits, and potential impact on healthcare delivery. **GitHub:** https://github.com/tayabsoomro/ORHuddle

- **MICAS** - MinION Classification & Alerting System
    - Developed the front-end of the MICAS application using React, creating a responsive and intuitive user interface that enables clinicians and researchers to receive real-time alerts about concerning DNA sequences directly on their mobile devices, facilitating point-of-care systems.
    - Engineered the application's backend using Flask, implementing robust, secure, and scalable server-side logic that supports the high-throughput processing of DNA sequencing data.
    - Integrated Redis and Celery for efficient task management and asynchronous task queuing, ensuring that DNA sequence analysis is performed promptly as new data is received from sequencers, enhancing the app's ability to deliver timely notifications.
    - Designed and implemented a sophisticated notification system that leverages mobile technology to alert users asynchronously of potential threats detected in DNA sequences, contributing to faster and more effective clinical decision-making.
    - **GitHub:** https://github.com/coadunate/MICAS

POSTER PRESENTATIONS

- Masood F, Thebeau J, Soomro T, Bezerra S.M, Jose M.S, Obshta O, Biganski S, Markova S, Camilli M, Raza M.F, Simko E, Ruzzini A, Wood S. (2023). **Antibiotic resistance and genomic characterization of North American Melissococcus plutonius isolates**. WCVM Graduate Student Poster Day, Saskatoon, SK
- Obshta O, Zabrodski M. W, Soomro T, Wilson G, Masood F, Thebeau J. M, Silva M. C. B, Biganski S, Kozii I, Koziy R, Raza M. F, Jose M. S, Camilli M, Markova S, Moshynskyy I, Ruzzini A, Simko E, Wood S. C. (2023). **Genetic determinants of oxytetracycline resistance in *Paenibacillus larvae* from Saskatchewan beekeeping operations**. WCVM Graduate Student Poster Day, Saskatoon, SK, Canada
- Soomro T, Jordan M, Watts S, Migicovsky Z, Forney C, Song J, Myles S. (2021). **Harvest Date Shapes Apple Volatilome**. Plant and Animal Genomes Conference, San Diego, CA, USA
- Soomro T, Napper S, Bonham-Smith PC. (2020). **Investigation of the *Arabidopsis thaliana* kinome after infection with Plasmodiophora brassicae and establishment of clubroot**. American Association for the Advancement of Science, Seattle, WA, USA

- Soomro T, Links MG. (2018). **Increased Usability of the MinION**. Mobilizing the Plant Phenotyping and Imaging Research Centre Symposium, Saskatoon, Canada
- Soomro T, Links MG. (2018). **Sequence & Forget: A new paradigm for MinION DNA Sequencing**. Research Fest: Department of Computer Science, Saskatoon, Canada
- Dowhy T, Soomro T, Links MG. (2018). **Interactive Exploration of Base-calls in Nanopore Data**. London Calling 2018, London, United Kingdom
- Dowhy T, Soomro T, Links MG. (2017). **Visualization of Nanopore Data with API Access to Data**. Nanopore Community Meeting, New York City, NY, USA
- Dowhy T, Postnikoff DL, Soomro T, Town JR, Ready, Dumonceaux TJ, Links MG. (2017). **Base-Call Event Detection on Nanopore Data Using Wavelets**. Annual Plant Phenotyping and Imaging Research Centre Symposium, Saskatoon, Canada
- Dowhy T, Ready B, Soomro T, Armitage A, Links MG. (2017). **Configuring Virtual Toolboxes with Ansible**. Annual Plant Phenotyping and Imaging Research Centre Symposium, Saskatoon, Canada

INVITED TALKS

- Data For Good Saskatchewan (2024). ***How Data is Used in Agriculture***
  How Data is used in Agriculture with Tayab Soomro from PathoScan
- Falling Walls Lab Atlantic Canada (2023). ***Breaking the wall of diagnostic roadblocks***.
- Canadian Society of Horticulture Science Annual General Meeting (2022). ***The aroma of apples.***
- UC Davis Plant Sciences Symposium (2022). ***The genetics of apple aroma.***
- Kentville Research & Development (KRDC) Series (2022). ***Exploring the genetic basis of aroma production in apples***.
- Institute of Comparative Genomics (ICG), Dalhousie University (2022). ***Introduction to pan-genomes and how to create one?***
- Institute for Comparative Genomics (ICG), Dalhousie University (2022). ***Understanding the genetic basis of aroma production in apples.***

MEDIA COVERAGE

- SaskToday (October 31, 2024). Saskatoon pathogen testing company launches products online.
- The Hamilton Spectator (October 24, 2024). Saskatoon pathogen testing company launches products online.
- U of S Horizons Project (August 6, 2024). Providing USask entrepreneurs with the support to succeed.
- The Western Producer (July 17, 2024). Entrepreneurs tout products at Ag in Motion event.
- Cultivator (July 4, 2024). From Labs to Fields: PathoScan's Journey in SK Agtech.
- FarmNewsHow (June 4, 2024). Agriculture Roundup for Tuesday, June 4, 2024.
- SaskNow (June 3, 2024). Agriculture Roundup for Monday June 3, 2024.
- Local Journalism Initiative (May 31, 2024). Speedy pathogen test kit ready for field testing.
- GlobeNewswire (May 8, 2024). Futurpreneur announces 2024 Canadian delegation for the G20 Young Entrepreneurs' Alliance Summit in Brazil.
- Local Journalism Initiative (May 6, 2024). Tech company funded for speedy pathogen testkit.
- Heriot-Watt University (December 13, 2023). Innovations to support people, purpose and planet unveiled at global university company creation competition.
- FutureScot (December 13, 2023). Global innovation challenge winners announced by Heriot-Watt university.
- SaltWire (November 3, 2022). Foodimprover harnesses fruit biodiversity to grow agriculture-based business
- U of S Student Spotlight (Jan 3, 2019). Research is in my DNA.

REFERENCES

References are available upon request