PHD RESEARCH DEVELOPMENT WORKSHOP

Unlock the Potential of Data Science in Your Research

PRAIRIE VIEW A&M UNIVERSITY **TSU — TEXAS SOUTHERN UNIVERSITY** **TEXAS A&M Institute of Data Science**

June 10–14, 2024 | 8:30 am–5:00 pm

Texas A&M University, Blocker Building, Room 220

Elevate Your Research to the Next Level!

This **free** five-day intensive workshop aims to provide students with valuable expertise in the methods and tools of **D**ata **S**cience, **A**rtificial **I**ntelligence, and **M**achine **L**earning (DS/AI/ML) that they can apply to their ongoing research. Applicants should have a research problem or problem area with applicable data identified. The workshop will provide students with the skills and guidance needed to elevate their research to the next level, including survey lectures on topics from the field, investigation of practical examples, and discussions on the applicability to students' research projects.

APPLY NOW

To promote engagement between instructor and students, the **class size is limited to 15 students** selected from workshop applicants. The **registration deadline is May 13, 2024, 11:59 PM**. Late submissions will not be accepted.

❖ **Tailored Learning:** Whether you're new to data science or looking to advance your skills, our workshop caters to all levels. Our pre-workshop survey ensures the content is customized to your needs.

❖ **Interactive Sessions:** Learn the latest techniques in AI and ML through hands-on practice. Bring your data, tackle real-world problems, and experience a day-long coding sprint.

❖ **Collaborate and Network:** Share your research challenges and brainstorm solutions with peers and experts. This is a unique opportunity to build connections that go beyond the workshop.

❖ **Expert Guidance:** Receive insights and mentorship from leading professionals in the field. Our experts are here to guide you through the complexities of data science applications in the participants' research.

❖ **Reflect and Plan:** Engage in discussions about the successes and challenges encountered during the workshop. Leave with a clear vision of how to apply these cutting-edge techniques to your research.

What do we mean by free?

The workshop is provided free of charge, and participants will receive a stipend for travel expenses. Lunch and snacks will be provided during the workshop. Participants will be reimbursed for hotel and mileage after the workshop.✣

If you have any questions regarding the workshop, please contact Drew Casey, Assistant Director for the Texas A&M Insitute of Data Science, at drew.casey@tamu.edu.

Eligibility and Application Process

Who is Eligible?

❖ **Any PhD Students:** The workshop is open to any PhD students from Prairie View A&M University (PVAMU), Texas Southern University (TSU), and Texas A&M University (TAMU). The workshop is designed for participants who have passed their qualifying exam, with a strong preference for having a problem or problem area already identified. The workshop will be less impactful for students in the final year of their degree program or who do not have a clearly defined dataset to work with. The goal is to provide students with the DS/AI/ML skills needed to elevate their current research activities. **Participants should bring datasets related to their research to the workshop**.

❖ **Open to All Domains:** While students must have some experience in applying statistical and computational methods, no detailed background in DS/AI/ML is assumed, and students from any domain are encouraged to apply. The workshop benefits students with complex data-driven research and who wish to incorporate DS/AI/ML-based methods into their work. **Participants are not expected to be experts in DS/AI/ML**. TAMIDS offers online Data Science Primer and Python Primer courses that applicants can use to prepare for the workshop.

> Students who cannot participate this year or do not have a research project yet are encouraged to apply in a subsequent year!

Your Application Packet

Interested applicants should upload a **single pdf file** to this Qualtrics Form by the **May 13, 2024, 11:59 PM** deadline. Late submissions will not be accepted.

The **PDF file** of your application should contain the following information:

1. **Cover Page**, listing:
   a. The title "2024 PhD Research Development Workshop Application" at the top of the page;
   b. Your Name, Major, Department, Institution, and Email Address;
   c. Your Advisor's Name, Title, Department, Institution, and Email Address;
   d. Statement of your commitment to attend the complete workshop if your application is successful (80 words maximum).
2. **Professional Development Statement** with an overview of your PhD research problem and the benefit you hope to derive from attending this workshop (500 words maximum). Include a brief description of your research problem or problem area with any applicable data you have identified.
3. **Your Resume**, including a list of relevant graduate courses taken, publications you have authored, and any relevant proficiencies and skills (two pages maximum).
4. **A Letter of Support** from your PhD advisor, including consent to miss any other academic activities (e.g. lectures) scheduled at the same time as the workshop.
5. (*Optional*) **Documentation of Connection to DS/AI/ML**: If applicable, you can demonstrate existing connections between your research area and DS/AI/ML. Possible formats include but are not limited to detailed references to external documents, reports, and support letters (two pages maximum).

Review Process and Selection Criteria

There are **15 available slots** for the Summer 2024 workshop, with a preference given to applicants who have identified a problem or problem area and would benefit from including DS/AI/ML methods in their research. The NASA-DEAP committee will review applications competitively, and **awards will be communicated by May 27**, 2024.

Workshop Schedule

Pre-Workshop

- ❖ **Pre-Workshop Survey:** Before the workshop, participants will complete a survey to assess their skill levels and specific interests. This will help the organizers to tailor the content to the participants' needs.
- ❖ **Create a _Texas A&M High Performance Research Computing_ (HPRC) Account:** Participants will apply for accounts at HPRC if they don't have one already (New User Information). Click on the "Account Applications page" link under the "Getting An Account" heading.
- ❖ **Complete TAMIDS Primers:** Participants without a strong background in Python or Data Science techniques should complete TAMIDS's Data Science Primer and Python Primer courses before attending the workshop.

<p align="center">Participants should bring their research data to the workshop.</p>

Day 1. Data Science Refresher and Introduction to DS/AI/ML Techniques

Instructors will go over basic and advanced DS/AI/ML techniques, based on the familiarity of participants. For more experienced students, we delve into cutting-edge methods and their applications in various research fields.

Day 2. Project Introductions and Feedback Sessions

Participants will present their research problem, highlighting where they believe DS/ML/AI could be beneficial. After each presentation, there will be time for questions and suggestions from peers and instructors, fostering a collaborative environment.

Day 3. Group-Based Discussions and Exploration

Participants will form groups based on similar research interests or challenges to discuss possible DS/ML/AI approaches to their research projects, guided by facilitators who are knowledgeable in these fields. Additionally, participants will have time to apply DS/AI/ML techniques they have learned so far to explore their datasets.

Day 4. Practical Session and Face-to-Face Consultations

Participants (in groups) will define a smaller, manageable problem and spend a day in a coding sprint to address it. For this mini-project, **participants are encouraged to bring datasets related to their research**. The workshop will provide mentors who can assist with technical challenges and offer guidance on best practices.

Day 5. "Successes and Challenges" Reflection and Future Steps

Participants will share what worked well and what challenges they encountered during their mini-projects. Groups will discuss the similarities and differences in DS/ML/AI problems tackled across different research areas. Mentors will help participants outline their next steps in applying what they have learned to their research.

Instructor
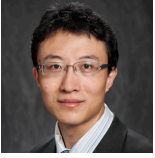
Jian Tao, PhD (he/his/him)

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