UTEP
APPLIED AI
INNOVATION INSTITUTE

UTEP Machine Learning Miniseries:

Leveraging the Texas Advanced Computing Center

Summer 2025 Report

The University of Texas at El Paso

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Executive Summary

This multi-part workshop series was designed to progressively develop foundational competencies in Machine Learning and Deep Learning, utilizing computational resources provided by the Texas Advanced Computing Center (TACC). This report presents a summary of the data collected through registration forms, attendance records, post-workshop surveys, and informal participant feedback, both verbal and written. It also includes observations and insights contributed by the workshop instructors.

The workshop was initially planned with a capacity of 30 participants, based on the compute resource allocation requested from TACC, which totaled 1,400 compute hours.

A total of 77 individuals registered for the workshop, with the following distribution: 13 faculty members, 53 graduate students, 6 staff members, and 5 categorized as "other." Participant selection prioritized those with research-focused needs. Remaining registrants were placed on a waitlist and are given priority in future workshop offerings.

Workshop Agenda and Schedule

- TACC Overview and Python Essentials – July 7, 2025
- Introduction to AI and ML July 14, 2025
- Supervised ML – July 21, 2025
- Unsupervised ML – July 28, 2025
- Deep Learning and Using GPUs on TACC – August 4, 2025

For session goals and detailed topic outline see Appendix A.

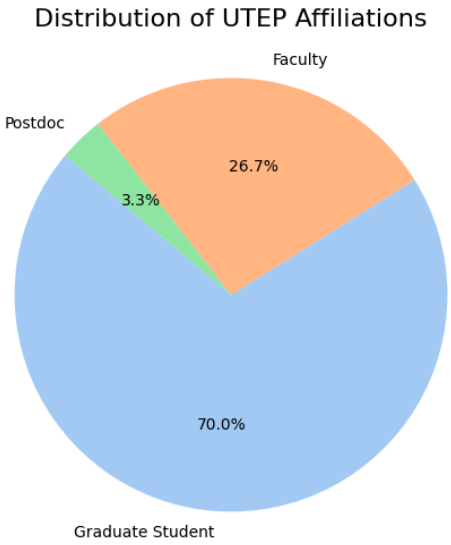
Instructors

- **M.S. Francisco Osuna**
  Senior Systems Programmer and Technical Lead
  UTEP Applied AI Innovation Institute
- **M.S. Luis Garnica Chavira**
  Research Associate and Technical Lead
  UTEP Applied AI Innovation Institute
- **Dr. Khodeza Mitchell**
  Assistant Professor of Research
  Department of Biological Sciences
- **Fabian Ornelas *(Teaching Assistant)***
  Undergraduate Research Assistant
  Department of Computer Science

Workshop Attendance and Participant Profiles

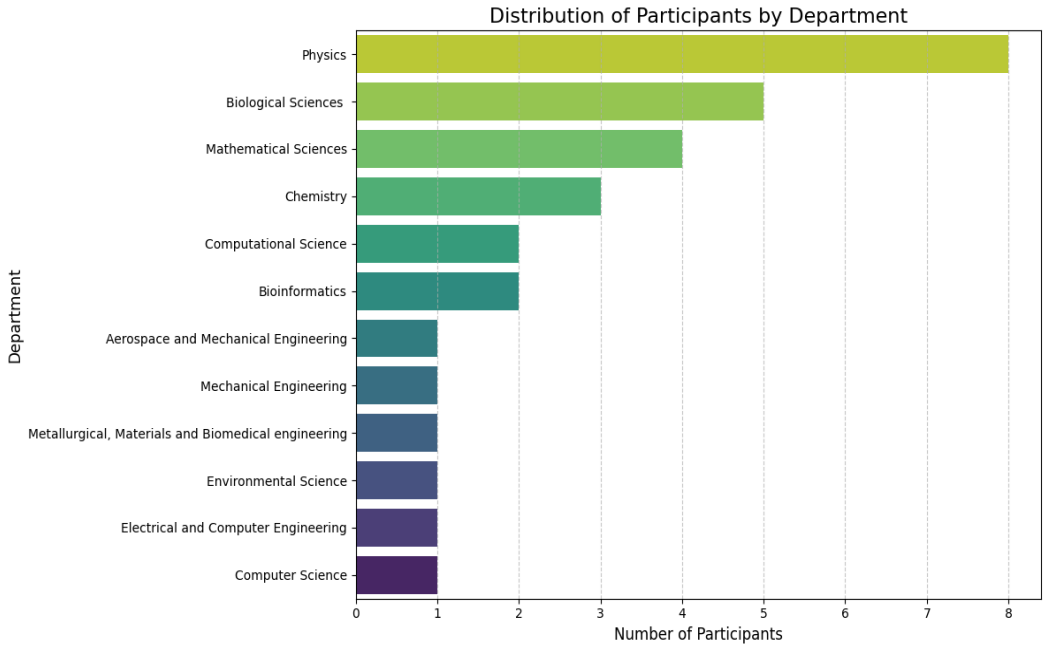
The participation roster comprises a sample of 30 individuals (n = 30) who actively engaged in the workshop sessions. Participant data was sourced from the registration forms submitted prior to the workshop.

Distribution of UTEP Affiliations

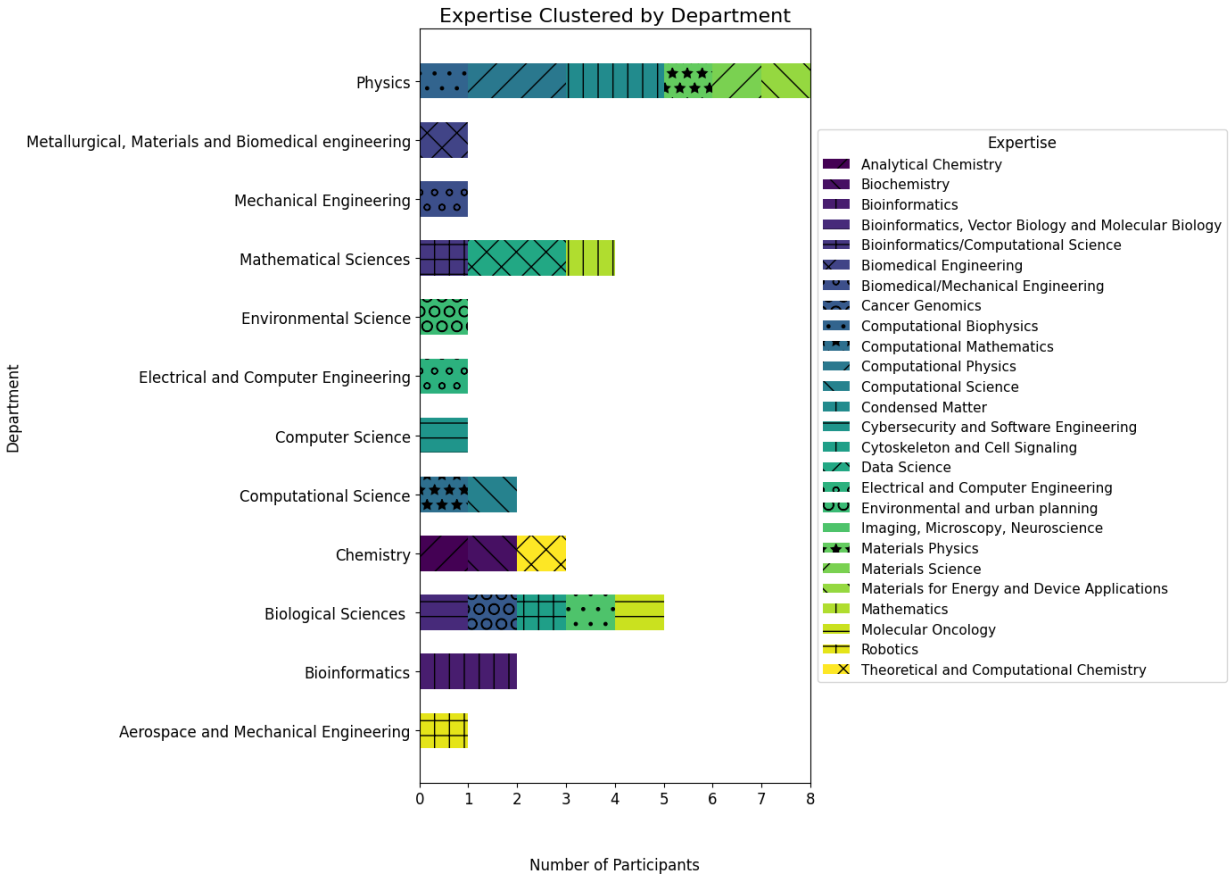


Department/College

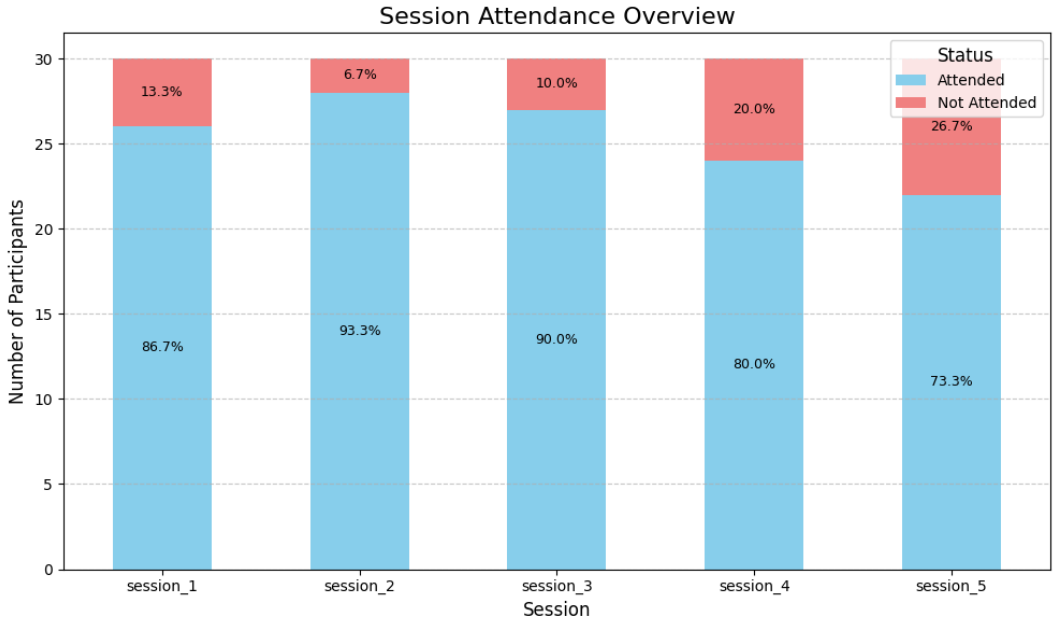
Most workshop participants were faculty members or graduate research students from the Physics department working in materials research. Additional representation came from fields such as Chemistry, Biology, Computational Science, and Engineering.



Expertise



Attendance



Post-Workshop Evaluation Summary

This evaluation summary is based on responses collected through an online post-workshop survey. Out of the 30 participants who attended the workshop, 18 completed the post-workshop survey, resulting in a response rate of 60% (n = 18). Of these, 17 provided valid coded responses (e.g., Likert scale and multiple-choice questions).

Workshop Discovery Channels

Q1: How did you first hear about TACC's Machine Learning for Life Sciences Research Institute through our workshop, or somewhere else?

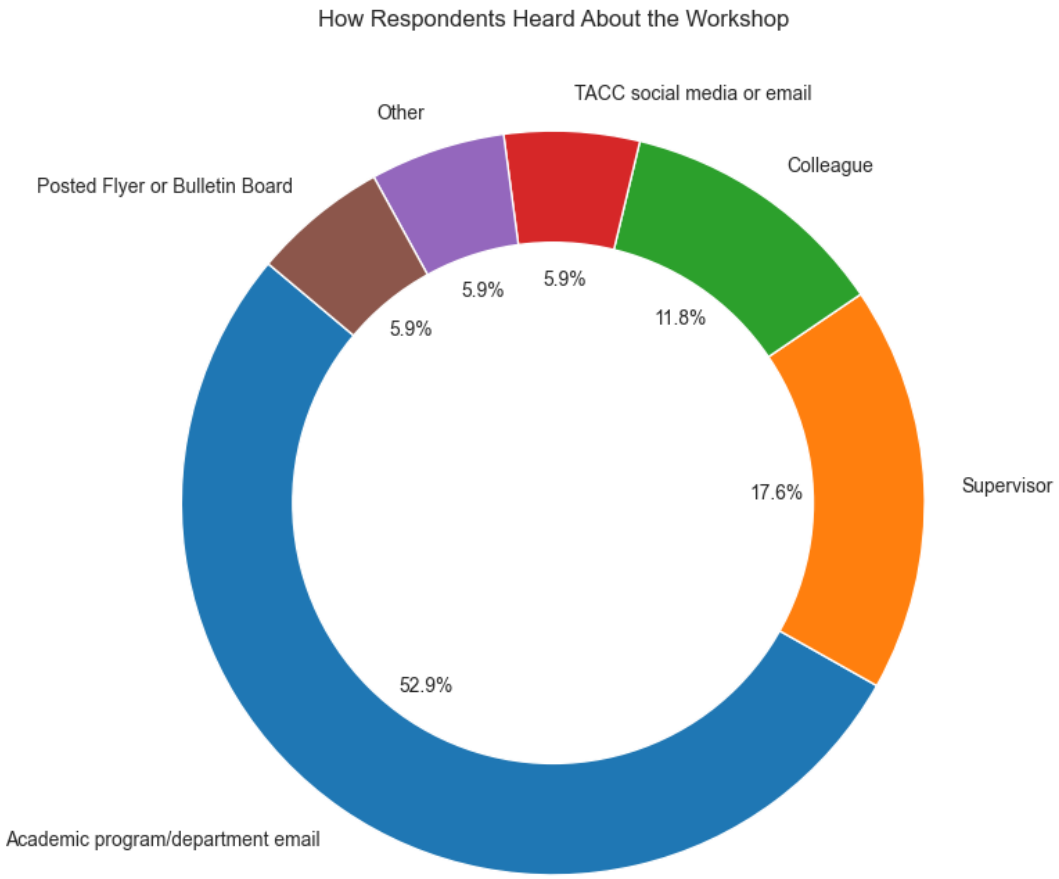


Figure 1: Donut chart with proportion of participants by discovery channel.

Coded Responses: *17*
Response Rate: *100%*

Reasons for Attending the Workshop

Q2. Why did you decide to attend the workshop? (Select all that apply.)

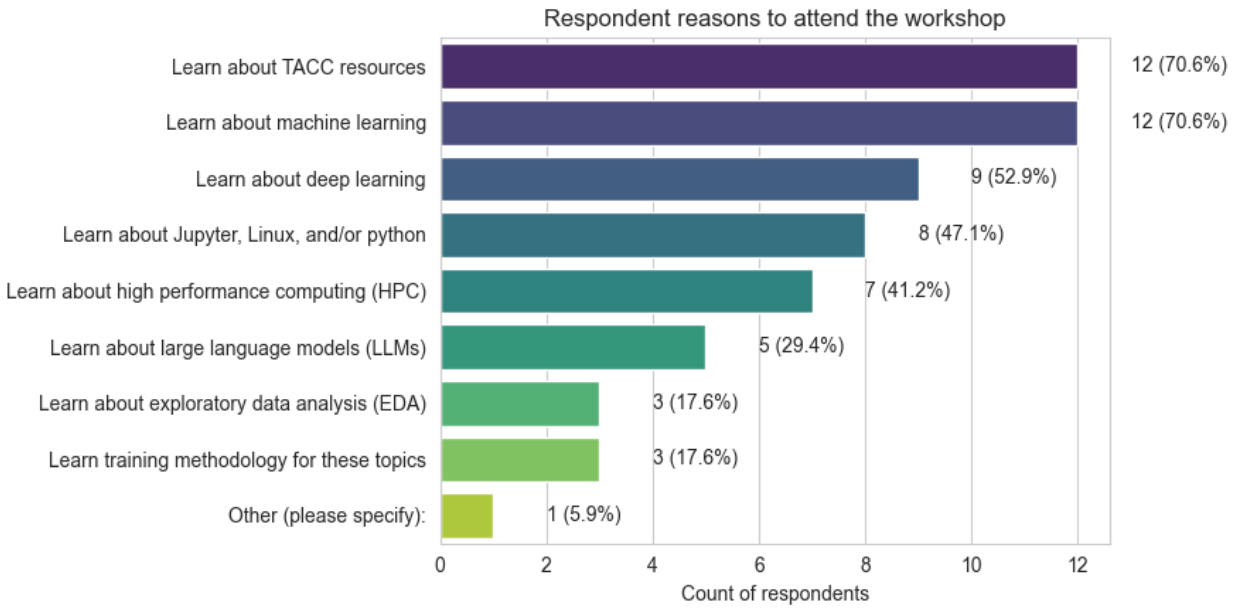


Figure 2: Horizontal bar chart of reasons to attend the workshop (more than one reason can be selected).

Coded Responses: *17*
Response Rate: *100%*

Workshop Satisfaction: Agreement Ratings

Level of agreement with the following statements:

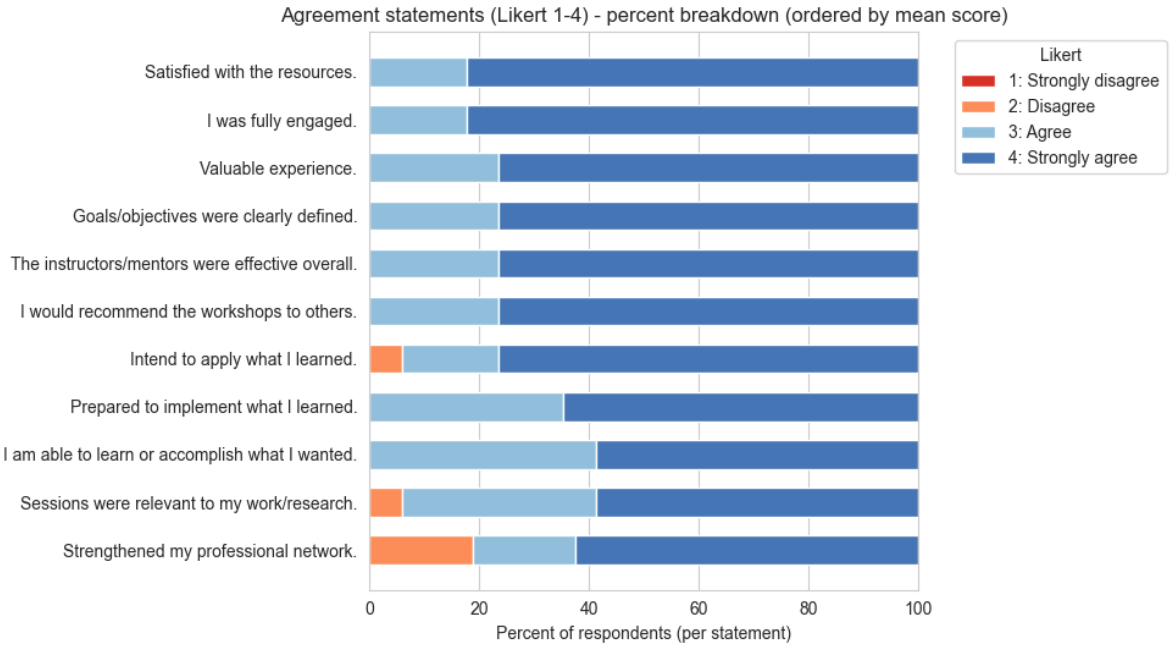


Figure 3: Horizontal stacked bar chart with percent breakdown of participant agreement (more than one reason can be selected).

Coded Responses: *17*
Response Rate: *100%*

Utility of Resources

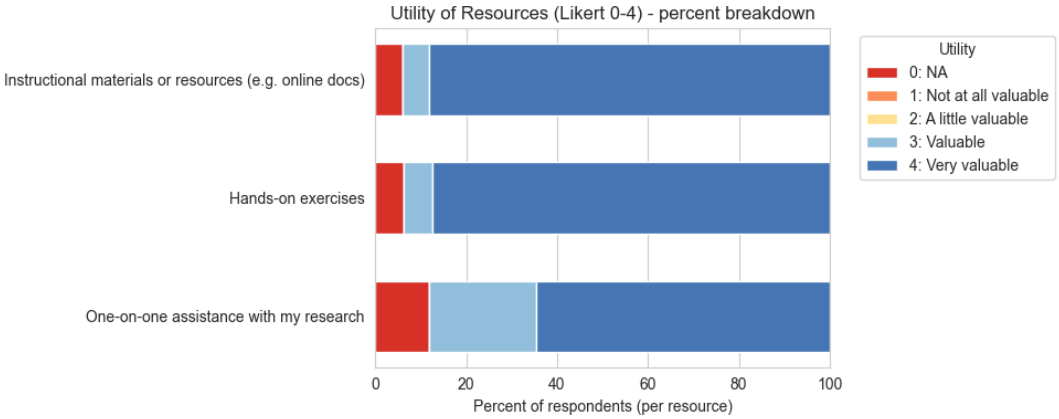


Figure 4: Horizontal stacked bar chart with percent breakdown of resource utility score.

Coded Responses: *17*
Response Rate: *100%*

Value of Learning Outcomes

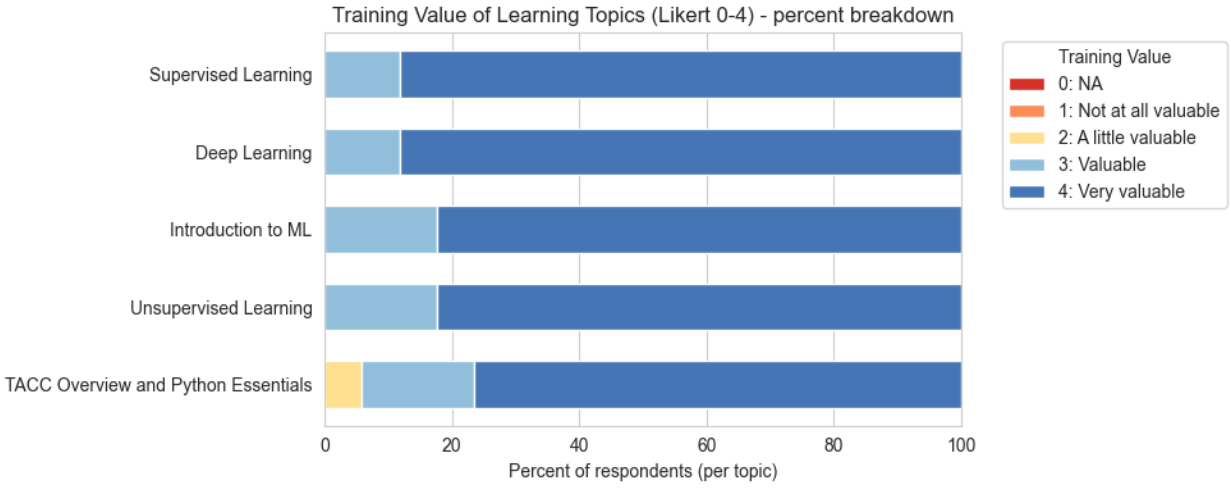


Figure 5: Horizontal stacked bar chart with percent breakdown of learning outcome score.

Coded Responses: *17*
Response Rate: *100%*

Skill Development Outcomes

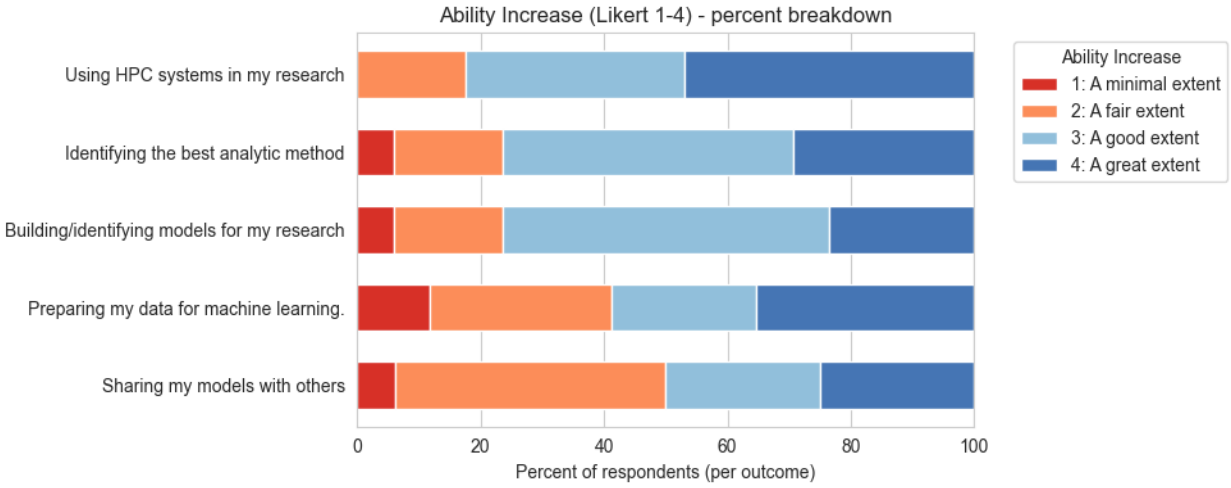


Figure 6: Horizontal stacked bar chart with percent breakdown of skill development increase.

Coded Responses: *17*
Response Rate: *100%*

Workshop Impact on Topic Comprehension

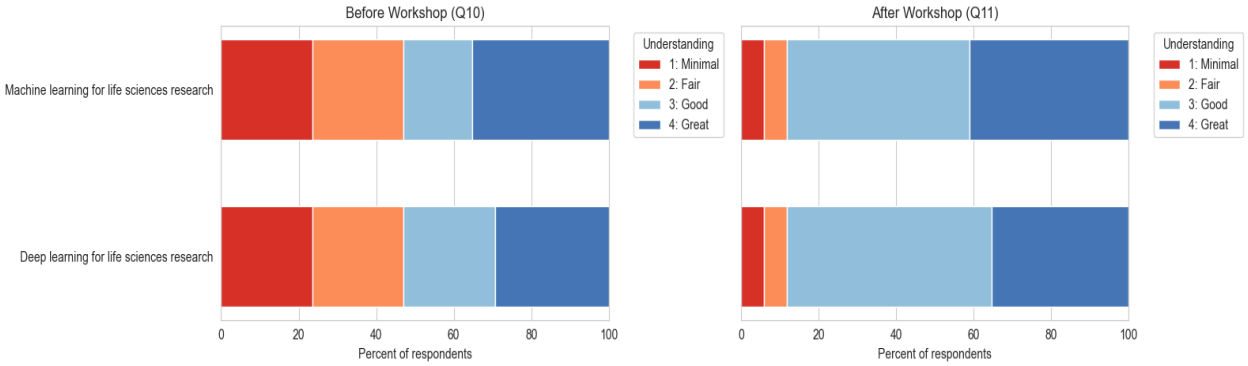


Figure 7: Horizontal stacked bar chart with percent breakdown of core topic understanding before and after the workshop series.

Coded Responses: *17*
Response Rate: *100%*

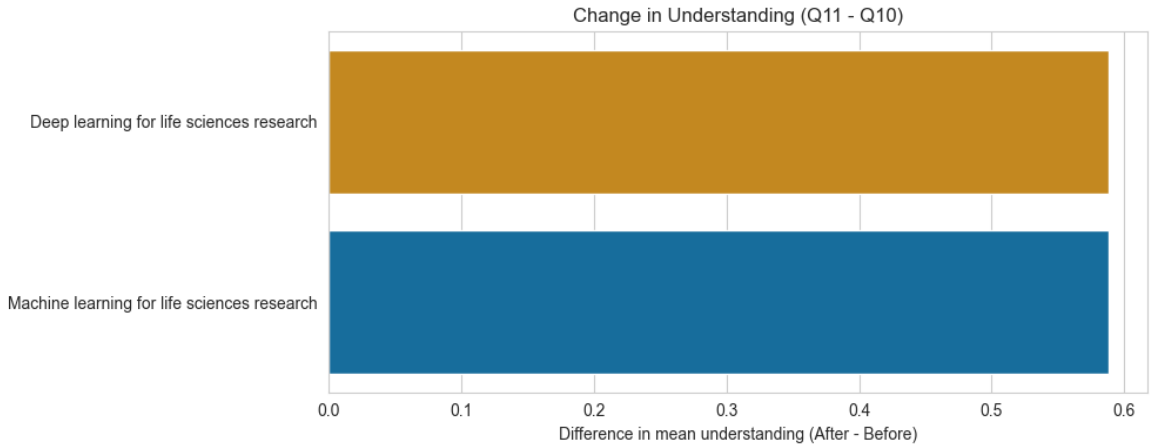


Figure 8: Change in Mean Understanding Across Core Topics (Pre vs. Post)

Coded Responses: *17*
Response Rate: *100%*

Participant Roles in Computational Research

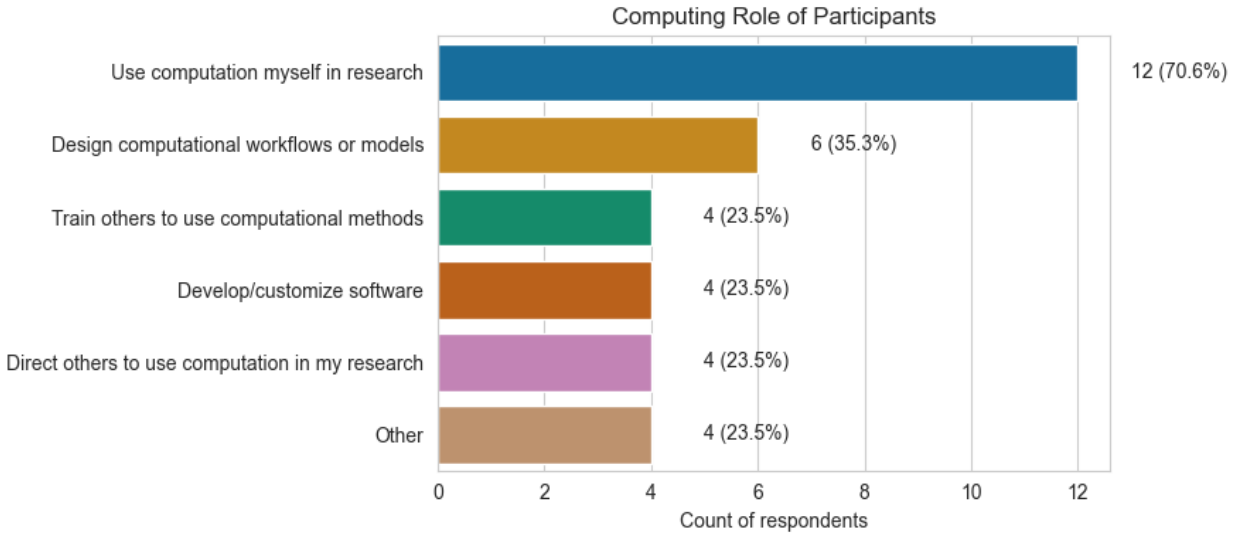


Figure 9: Horizontal bar chart of role count by participants (more than one can be selected).

Coded Responses: *17*
Response Rate: *100%*

Qualitative Analysis of Open-Ended Responses

A total of 15 participants submitted valid free-text responses. However, some open-ended questions were left unanswered, resulting in variable response rates across different survey items.

Most Valuable Workshop Components

Q12: What was the most useful part of the workshop?

Response Rate: 93.3% - n=14/15

Question	Response Theme	Number of Instances
Q12: What was the most useful part of the workshop?	*Hands on excersises*	*6*
	TACC resources	*3*
	Deep Learning	*2*
	Visualizations	*1*

Sample of quotes aligning of quotes aligning top themes:

"The most useful part of the workshop was the hands on visualization of how changing neural network parameters like hidden layers and activation functions affects model behavior and decision boundaries."

"I found the practical activities during the workshop to be the most helpful."

"Introduction to the available TACC resources and how to gain access to them. Refresher on ML through the workshop.

Impact on Work and Research

Q13: In what ways, if any, could TACC life sciences institute resources impact your work/research?

Response Rate: 80% - n=12/15

Question	Response Theme	Number of Instances
Q13: In what ways, if any, could TACC life sciences institute resources impact your work/research?	*Enhance Efficiency*	*2*
	Large Scale Models and Data	*2*
	Enhance Productivity	*2*
	Creation of Machine Learning Pipelines	*1*
	Learn to analyze biomedical images (image classification)	*2*
	Improve search of genetic biomarkers	*1*
	Complex Analysis	*1*
	Unsure	*1*

Sample of quotes aligning to top themes:

"Potentially leverage the available resources to enhance research efficiency and productivity."

"I'm doing my PhD in biomedical engineering and this workshop provided me with the opportunity to learn about the different aspects of my project and learn how to analyze the biomedical images"

"TACC life sciences institute resources could significantly enhance my research by providing high performance computing power for large scale genomic data analysis, including DNA/RNA sequencing, protein structure prediction and machine learning based bioinformatics pipelines."

"Sure. It provides great opportunities to improve and make easier some experiments."

Summary of Written Feedback

Content

- Expand Technical Scope: Participants requested the inclusion of advanced and relevant research libraries, specifically PyTorch and Keras, as they are considered more valuable tools for research applications.
- Introduce New Topics: Integrate sessions on Large Language Models (LLMs) and Model Development to keep the workshop content current and aligned with AI trends.

Scheduling

- Optimal Timing: Schedule workshops early in the academic semester (e.g., February for Spring, September for Fall) to maximize relevance for ongoing research projects.
- Day of the Week: Consider holding sessions on days other than Monday to potentially improve attendance and engagement.
- Format: Offer the workshop during the academic semester with hybrid attendance options.

Engagement

- Ensure longer Q&A sessions are provided.
- Schedule breaks more evenly throughout the day to help maintain participant focus and engagement.

Feedback Scope

- **Broaden Feedback Scope:** The post-workshop survey should be revised to be less specific to life science research. Include questions relevant to other research areas to gather more appropriate and representative feedback from all participants.

Summary of Verbal Feedback

- Strong appreciation for the step-by-step, hands-on approach used during the workshop. This method allowed them to grasp the exercises in manageable segments and provided a clear, detailed understanding of the entire workflow involved in building machine learning models. Breaking down the process into smaller, guided steps was especially helpful for reinforcing key concepts and ensuring that participants could follow along without feeling overwhelmed.
- Tailor workshop content to better align with the disciplinary backgrounds of attendees. Structuring sessions to reflect specific academic or research areas could enhance relevance and engagement.
- It would be helpful to get a more detailed review of the python language but was still able to keep up with the format of the exercises and appreciated the step-by-step examples.
- Provide a dedicated section on estimating compute power requirements for research projects. They expressed that it would be valuable to include guidance on how to assess the computational resources needed to scale their models in terms of memory, processing power, and GPU usage. This addition would help researchers better plan their infrastructure needs, budget for cloud or local hardware, and avoid under or over-provisioning compute resources for their experiments.
- Having to code parts of the exercises themselves helped them conceptually understand how the ML techniques integrated as a whole.
- Increase the number of personnel available for technical assistance during workshops. Consider involving trained student workers to help attendees with connectivity and setup issues.
- Future workshops should be held in spaces with easier access to power outlets, preferably desks with built-in outlets to support device usage.
- Schedule office hours at a different time or day than the main workshop sessions to allow for more flexibility and availability.
- Encourage attendees to apply workshop concepts to their own datasets and use office hours for follow-up support and personalized guidance.

Instructor Observations

- **Programming Experience:** Approximately half of the participants had prior experience with Python, while the remainder were new to the language. A small subset had no programming background at all, which influenced their pace and level of engagement throughout the sessions.
- **Session 1 Technical Delays:** The first session experienced delays primarily due to issues with authentication and SSH setup. As a result, some planned content was deferred and successfully covered in Session 2.
- **Variation in Completion Pace:** Participants progressed at varying speeds. Those with technical backgrounds advanced quickly, while those with less background in computing encountered challenges and required additional support to navigate the materials.

- **Use of Printed Handouts:** Printed handouts were helpful during independent exercises, especially for environment setup and programming tasks. However, some participants struggled to follow the handouts early in the sessions and required substantial one-on-one assistance. This could be mitigated in future workshops by pairing the handouts with live, step-by-step demonstrations.

Workshop Learnings and Suggested Improvements

1. **Separate the environment setups from instructional sessions.** Have a dedicated session so that the environment setup (needed for the entire series) is completed with all participants. This includes not just the environments used in the first sessions but also any additional setups such as the Jupyter Kernel used for the last session (TensorFlow GPU).
2. **Prerequisites on Python.** Guide participants to specific materials to get essential knowledge of Python prior to the workshop or provide a complementary session for this purpose.
3. **Concise Examples.** Shorter examples that focus on the core concepts would allow for more hands-on and be more beneficial for participants.
4. **Minimize Configuration.** Avoid introducing additional tools/configurations that are not essential to the core learning objectives.
5. **Live Demonstrations.** Walking participants through configurations/examples in real-time seemed to be the most effective way to maintain engagement and reduce issues.
6. **Application of Surveys.** Dedicate the final 10-15 minutes of the workshop's last session to completion of the post workshop survey by all participants.

Positive Comments

"I want to extend my deepest thanks for your incredible work in organizing the Machine Learning Miniseries workshop. Your efforts through the Office of Research and Innovation at UTEP provided a truly impactful learning experience for life science researchers like myself.

From the engaging content to the supportive environment, every aspect of the workshop reflected your thoughtful planning and dedication to empowering our research community. I walked away with new skills, deeper insights, and a stronger sense of connection to the possibilities of AI in science.

Thank you again for your time, energy, and commitment to advancing research training at UTEP. Your contributions are deeply appreciated."

Source: Graduate Student Email

"The training was very valuable for me and I am already working with my advisor to be able to use the TACC resources. I would like to learn more about Large Language Models and the development."

Source: Postworkshop survey Q7

"I appreciate that the university provide the opportunities to students like me (Graduate Student) to take this kind of workshop. It was very valuable for me to improve my skills and refresh some knowledge to have a better performance in my research work. Thanks a lot!"

Source: Postworkshop survey Q21

APPENDIX A. Workshop Outline

Session 1: TACC Overview and Python Essentials

Goals

Get the attendees familiar with TACC resources.
Jump start attendees to programming in python.

Methodology

Participants are provided with printed materials with step-by-step instructions for environment configurations and exercises to get them familiar with the CLI and use of Python.

Topics

1. Get to know the audience.
2. TACC Overview.
    a. How to create an account
    b. TACC Resources
    c. HPC Architecture
    d. Types of Projects Supported by TACC
    e. Request an Allocation
3. Getting Started with TACC
    a. User Portal
    b. SSH basics and file transfers
    c. SLURM
    d. VIM
    e. Hands-on: TACC CLI Environment
        i. Log in to TACC via terminal
        ii. Navigate the environment
        iii. Run script on interactive session
        iv. Run script as a SLURM job
4. Using Jupiter on TACC
    a. How to launch Jupyter Hub on Vista
    b. Running and saving notebooks
5. Python Essentials
    a. Python Refresher
    b. Hands-on: Python exercise with VIM

Session 2: Introduction to Artificial Intelligence and Machine Learning

Goals
Introduce the foundational concepts of AI and Machine Learning (ML).
Use of Linear Regression to apply the basic concepts.

Methodology
Participants are provided notebooks separated by each major topic. The notebook exercises are built-up as the subtopics are covered. The participants must complete missing lines of code.

Topics

1. Exploratory Data Analysis (EDA)
    a. Hands-on: Pandas, Matplotlib and Seaborn
2. Introduction to Machine Larning
    a. AI Overview
    b. What is Machine Learning?
    c. Types of ML Systems
        i. Supervised
        ii. Unsupervised
        iii. Reinforcement
        iv. Generative AI
    d. ML High Level Process
3. Regression and Classification
    a. Labeled Example
    b. Exercise: Pop-Quiz
4. Linear Regression
    a. Line Function
    b. Exercise: Pop-Quiz
    c. Hands-on: Manual Linear Regression
    d. Loss Functions
    e. Hands-on: Loss Functions
    f. Scikit Learn
    g. Hands-on: Linear Regression with scikit-learn
    h. Gradient Descent
    i. Hyperparameters
        i. Learning Rate
        ii. Batch Size
        iii. Epochs

Session 3: Supervised Learning

Goals

Learn core algorithms in supervised learning.
Understand model training, testing, and evaluation.

Methodology

Participants will work with an end-to-end notebook that applies a classification workflow to a dataset. They will apply the concepts they've learned by completing the missing lines of code. The full, solved notebook will then be reviewed at the end of the session.

Topics

1. Gradient Descent
2. Hyperparameters
    a. Learning Rate
    b. Batch Size
    c. Epochs
3. Classification
    a. Linear Classification
    b. Perceptron and Logistic Regression: Sigmoid function and log loss
    c. How do we build a classifier?
    d. Train-Test Split
    e. Types of Splitting
    f. Generalization and Overfitting
    g. Scaling Features
    h. Classifier Training
4. Regularization (alpha values)
5. Validation
    a. Accuracy
    b. Confusion Matrix
    c. Precision
    d. Recall
    e. F1 Score
6. Hands-on: Machine Learning with the Iris Dataset
7. Extra Exercise: Ski Learn Breast Cancer Dataset

Session 4: Unsupervised Machine Learning

Goals

Understand unsupervised machine learning and its distinction from supervised methods. Learn essential data preparation techniques and perform dimensionality reduction using PCA and t-SNE. Cover different clustering algorithms like K-means and DBSCAN, along with their key evaluation metrics.

Instruction Methodology

This session uses an **end-to-end exercise** built in a Jupyter Notebook. This notebook is developed incrementally as topics are explained. The instructor will guide participants through the topics using either a clean or a messy dataset example. At the end of the exercise, the instructor shows how to apply the same notebook to a different data source by simply changing the input.

Topics

1. Unsupervised Machine Learning
    a. Supervised vs. Unsupervised Learning
2. Data Preparation
    a. Data Preprocessing and Management
    b. Missing Data Handling
    c. Data Standardization
    d. Hands-on: Data Preparation
3. Dimensionality Reduction
    a. PCA: finding principal components
    b. T-SNE: preserving local structures for visualization
    c. Heatmaps
    d. Hands-on: Reduce Dimensionality with PCA and visualize clusters
4. Clustering
    a. Evaluation Metrics (inertia, silhouette).
    b. K-means Clustering
    c. Hierarchical Clustering
    d. DBSCAN Clustering

Session 5: Deep Learning and Using GPUs on TACC

Goals

Understand neural networks and deep learning workflows.
Run an end-to-end deep learning implementation of CNN leveraging GPU processing.

Topics

1. ML Picture and Workflow
    a. Machine Learning Subsets
    b. Machine Learning Workflow
    c. Reframing the History of deep learning
2. Deep Learning Fundamentals
    a. Deep Learning
    b. The performance of traditional ML methods and neural networks with respect to dataset size.
    c. Recap: Structure of an Artificial Neuron (Perceptron)
    d. Activation Functions: Sigmoid, ReLU, Softmax, Tanh
3. Multilayer Perceptron (MLP)
    a. Basic Architecture
    b. Training and Inference
    c. From Linearly Separable to Complex Patterns
    d. Overfitting vs. Generalization: Finding the Right Balance
    e. Regularization: L1 and L2, Dropout, Early Stopping
    f. Hands-on: MLP Classification
4. Convolutional Neural Networks (CNNs) and GPU Parallelization
    a. Image Classification Challenges
    b. ANN challenges with images
    c. CNN Grid Data Processing: Convolution and Pooling Layers
    d. CNN Basic Architecture
    e. VGG-Net Architecture
    f. TensorFlow with GPU Support
    g. Hands-on: TACC exercise – Classification of Coral Reefs with CNN
5. Closing and Feedback
    a. Explore NN Architectures.
    b. Explore other Tools.

APPENDIX B. Registration Form

Q1. Ful Name

Q2. Email. Your email will be used exclusively by the workshop organizers and TACC personnel to send registration invitations for the TACC platform and to communicate relevant information regarding the workshops.

Q3. UTEP Affiliation

- Faculty
- Graduate Student
- Staff
- Other (please specify): _____

Q4. College/Department

Q5. Major or Area of Expertise

APPENDIX C. Postworkshop Survey

The purpose of this survey is to learn more about your experiences in the workshops and help improve the resources used from the Texas Advanced Computing Center (TACC) Institute: Machine Learning for Life Sciences Research. Your responses will be kept confidential.

Interest and Attendance

Q1. Did you first hear about TACC's Machine Learning for Life Sciences Research Institute through our workshop, or somewhere else?

- TACC website
- TACC social media or email (please specify): _____
- Academic program/department email
- Colleague
- Supervisor
- Posted flyer on bulletin board
- Conference or workshop (please specify): _____
- Other listserv (please specify): _____
- Other social media (please specify): _____
- Other (please specify): _____

Q2. Why did you decide to attend the workshop? *(Select all that apply.)*

- To learn about TACC resources
- To learn about Jupyter, Linux, and/or python
- To learn about exploratory data analysis (EDA)
- To learn about machine learning (e.g., classification, principal component analysis)

- To learn about deep learning (e.g., convolutional neural networks)
- To learn about high performance computing (HPC)
- To learn about large language models (LLMs)
- To learn training methodology for these topics
- At the direction of supervisor, professor, or advisor
- Other (please specify): _____

Workshop Participation and Satisfaction

Q3. What days did you attend the workshops? *(Select all that apply.)*

- Monday, July 7
- Monday, July 14
- Monday, July 21
- Monday, July 28
- Monday, August 4

Q4. Please rate your level of agreement with the following statements.

	Strongly Disagree	Disagree	Agree	Strongly Agree
Overall, I was satisfied with the resources provided by TACC.	❍	❍	❍	❍
Participating in the workshops was a valuable experience.	❍	❍	❍	❍
I was fully engaged in the workshops on the date(s) I attended.	❍	❍	❍	❍
I feel prepared to implement what I learned in the workshops to my work/research when/if applicable.	❍	❍	❍	❍
I intend to apply what I learned in the workshops to my work/research.	❍	❍	❍	❍
I was able to learn or accomplish what I wanted during the workshops.	❍	❍	❍	❍
The workshops' goals/objectives were clearly defined.	❍	❍	❍	❍
The instructors/mentors were effective overall.	❍	❍	❍	❍
The training sessions were relevant to my work/research.	❍	❍	❍	❍
I built/strengthened my professional network during the workshops.	❍	❍	❍	❍
I would recommend the workshops to others.	❍	❍	❍	❍

Utility of Institute Resources

Q5. Please rate the extent to which you valued the following resources provided by TACC Lifesciences Research Institute.

The institute resources are …	Not at all valuable	A little valuable	Valuable	Very valuable	*NA: I did not use this resource.*
One-on-one assistance with my research	❍	❍	❍	❍	❍
Hands-on exercises	❍	❍	❍	❍	❍
Instructional materials or resources (e.g., online content at readthedocs, code, documentation)	❍	❍	❍	❍	❍

Utility of Training Sessions

Q6. Please rate the extent to which you valued the training sessions.

Session Name	Not at all valuable	A little valuable	Valuable	Very valuable	*NA: I did not participate.*
TACC Overview and Python Essentials	❍	❍	❍	❍	❍
Introduction to ML	❍	❍	❍	❍	❍
Supervised Learning	❍	❍	❍	❍	❍
Unsupervised Learning	❍	❍	❍	❍	❍
Deep Learning	❍	❍	❍	❍	❍

Q7. [Do not request or force response] **We welcome any additional feedback or comments on the training sessions.** For example, if a session was only "a little valuable" because you already knew the material, you could note that here.

Learning Outcomes

Q8. Please rate the extent to which your ability level in the following areas increased as a result of the workshops.

The workshops increased my ability level …	A minimal extent	A fair extent	A good extent	A great extent
Preparing my data for machine learning (e.g., organizing, EDA)	❍	❍	❍	❍
Identifying the best analytic method (e.g., regression, PCA) for my data/research questions	❍	❍	❍	❍
Building/identifying models for my research	❍	❍	❍	❍
Using HPC systems in my research	❍	❍	❍	❍
Sharing my models with others	❍	❍	❍	❍

Q9. [Do not request or force response] **If you would like to clarify any of your responses for this section (e.g., no change in a particular ability because of prior knowledge), please do so here.**

Q10. Please rate your level of understanding in the following areas BEFORE participating in the institute.

My level of understanding **BEFORE** the workshops:	Minimal	Fair	Good	Great
Machine learning for life sciences research	❍	❍	❍	❍
Deep learning for life sciences research	❍	❍	❍	❍

Q11. Please rate your level of understanding in the following areas AFTER participating in the institute.

My level of understanding **AFTER** the institute:	Minimal	Fair	Good	Great
Machine learning for life sciences research	❍	❍	❍	❍
Deep learning for life sciences research	❍	❍	❍	❍

Additional Feedback

Q12. [Request response] **What was the most useful part of the workshop?**

Q13. [Request response] **In what ways, if any, could TACC life sciences institute resources impact your work/research?**

Q14. [Request response] **What do you recommend to improve the logistical aspects of the workshops?** (For example, location, time of year, timing of breaks, etc.)

Q15. [Request response] **What do you recommend to improve the content or other aspects of the workshops?** (For example, speakers, feedback on specific sessions, session formats, additional topics, etc.)

Q16. [Request response] **What additional learning opportunities provided by TACC or UTEP, if any, are you interested in?**

Professional Background

Q17. What is your primary professional role?

- Undergraduate student
- Graduate student
- Postdoctoral scholar/fellow
- Faculty member
- Other college or university research or instructional staff member
- Other nonprofit researcher
- Private sector researcher
- Government researcher

- Retired
- Other (please specify): _____

Q18. What is your main involvement with computing research in your role? *(Select all that apply.)*

- Train others to use computational methods
- Design computational workflows or models
- Develop/customize software
- Use computation myself in research
- Direct others to use computation in my research
- Direct others to use computation in my research
- _____

Q19. In what fields do you primarily work? *(Select all that apply.)*

- Core biological sciences (e.g., botany, cell biology, genetics, microbiology, molecular biology, paleontology, zoology): _____
- Environmental sciences (e.g., ecology): _____
- Biochemical and chemical life sciences (e.g., biochemistry, biotechnology, chemical biology): _____
- Medical and human life sciences (e.g., anatomy, epidemiology, human biology/physiology, immunology, neuroscience, pathology): _____
- Pharmaceutical sciences (e.g., pharmaceutics, pharmacology, medicinal chemistry, toxicology): _____
- Computational and applied life sciences (e.g., bioinformatics, food sciences): _____
- Other (please specify): _____

Consent for Research

Q20. Findings from this survey may be used in research dissemination (e.g., conference paper). The findings will be reported in aggregate across participants. No identifying information will be attached to responses. Do you consent for your responses to be used in this way?

- No
- Yes

Q21. [Do not request or force response] **If you have any additional comments or if you would like to clarify any of your responses on this survey, please do so here.**

APPENDIX D. Data Aggregation Tables

Post Workshop Survey

Q2. Why did you decide to attend the workshop?

Why did you decide to attend the workshop?	Count	Percent
Learn about TACC resources	12	70.60%
Learn about machine learning	12	70.60%
Learn about deep learning	9	52.90%
Learn about Jupyter, Linux, and/or python	8	47.10%
Learn about high performance computing (HPC)	7	41.20%
Learn about large language models (LLMs)	5	29.40%
Learn about exploratory data analysis (EDA)	3	17.60%
Learn training methodology for these topics	3	17.60%
Other (please specify):	1	5.90%

Q4. Please rate your level of agreement with the following statements.

Statement	Mean
Satisfied with the resources.	3.82
I was fully engaged.	3.82
Valuable experience.	3.76
Goals/objectives were clearly defined.	3.76
The instructors/mentors were effective overall.	3.76
I would recommend the workshops to others	3.76
Intend to apply what I learned.	3.71
Prepared to implement what I learned.	3.65
I am able to learn or accomplish what I wanted.	3.59
Sessions were relevant to my work/research.	3.53
Strengthened my professional network.	3.44

Q6. Please rate the extent to which you valued the training sessions.

Topic	Mean
Supervised Learning	3.88
Deep Learning	3.88
Introduction to ML	3.82
Unsupervised Learning	3.82
TACC Overview and Python Essentials	3.71

Q8. Please rate the extent to which your ability level in the following areas increased as a result of the workshops.

The workshops increased my ability level…	Mean
Using HPC systems in my research	3.29
Identifying the best analytic method	3.00
Building/identifying models for my research	2.94
Preparing my data for machine learning.	2.82
Sharing my models with others	2.68

Q10. Please rate your level of understanding in the following areas:

Before Workshop	Mean
Machine learning for life sciences research	2.65
Deep learning for life sciences research	2.59

After Workshop	Mean
Machine learning for life sciences research	3.24
Deep learning for life sciences research	3.18

Q18. What is your main involvement with computing research in your role? *(Select all that apply.)*

Role in Computing	Count	Percent
Use computation myself in research	12	70.60%
Design computational workflows or models	6	35.30%
Train others to use computational methods	4	23.50%
Develop/customize software	4	23.50%
Direct others to use computation in my research	4	23.50%
Other	4	23.50%