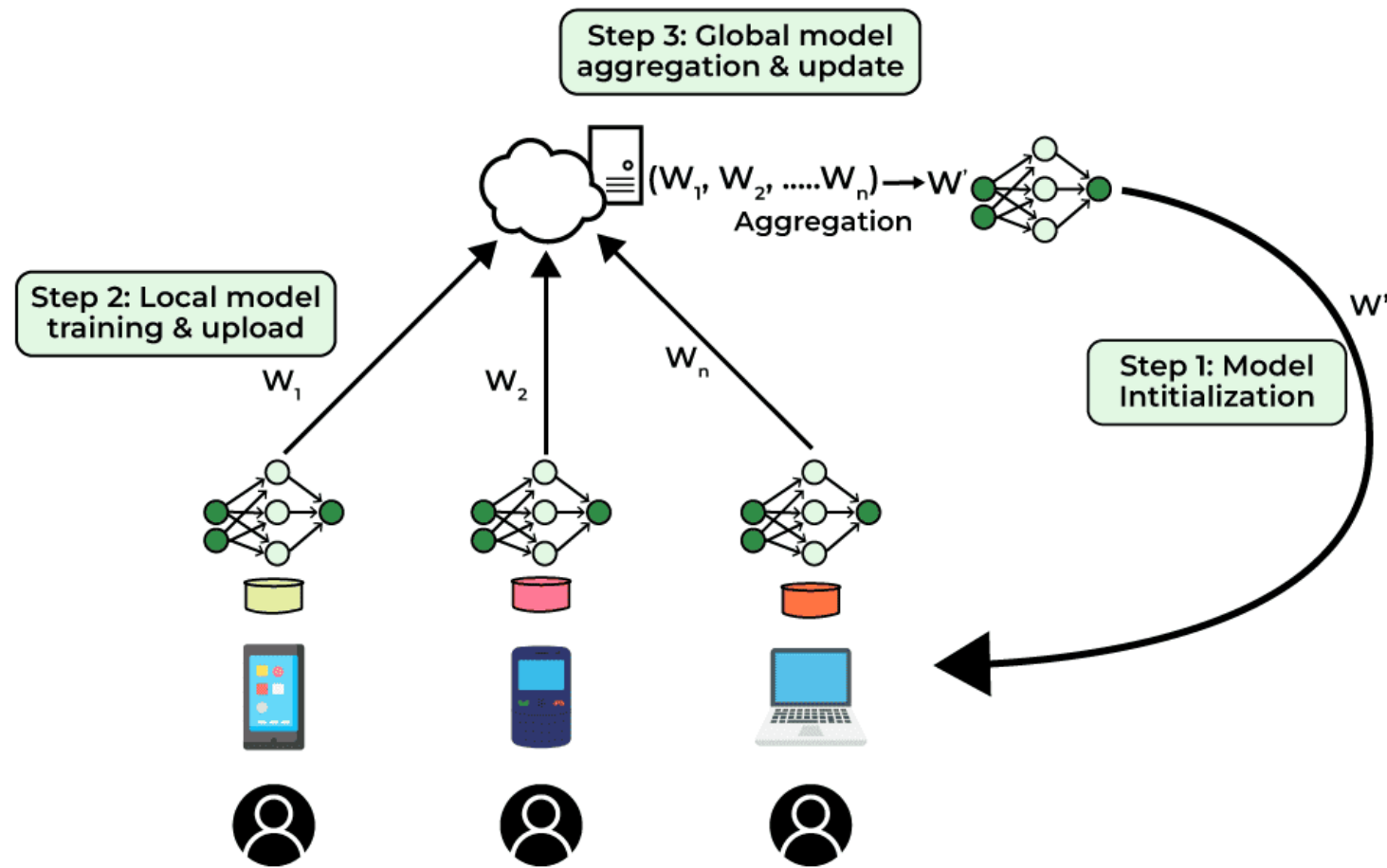




Empowering University Research through Remote Data Science

Professor John Fields

Empowering universities to jointly improve student success prediction while maintaining data privacy through innovative remote data science techniques.



Enhancing Student Success with with Remote Data Science

This NVIDIA grant proposal outlines a project that aims to enable universities to universities to collaborate on improving student retention prediction while while maintaining FERPA compliance through the use of remote data science science techniques.

Project Goals and Objectives



Enable Joint Improvement of Student Retention Prediction

Leverage NVIDIA H100 and A100 GPUs to enable secure and efficient collaborative data analysis for universities



Enable Joint Improvement of Student Retention Prediction

Facilitate multi-institutional collaboration to enhance student success prediction models



Maintain FERPA Compliance

Ensure the protection of student data privacy and meet regulatory requirements

By achieving these goals, the project will empower universities to collaborate on improving student retention while upholding FERPA compliance through the use of advanced remote data science techniques.

Our Collaborative Team



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Concordia University Wisconsin



Dr. Michael Litman

Professor and Chair, Computer Science
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Dr. Praveen Madiraju

Professor, Computer Science Department,
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Remote Data Science Approach

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The project will implement a two-tier architecture to enable secure and collaborative educational data analysis:

High Side: On-Premise Confidential Processing

NVIDIA H100 GPUs will be used for on-premise confidential data processing within secure enclaves, leveraging differential privacy techniques to ensure FERPA compliance.

Low Side: Encrypted Parameter Aggregation

NVIDIA A100 GPUs in the cloud will be used for encrypted parameter aggregation through federated learning, enabling cross-institutional collaboration without compromising data privacy.

Secure and Collaborative Data Analysis

This two-tier architecture allows universities to jointly improve student retention prediction while maintaining FERPA compliance through secure and collaborative data analysis.

Anticipated Outcomes

- **Peer-reviewed Publication**

The project aims to produce a high-impact, peer-reviewed academic paper that compares the performance, privacy, usability, scalability, and FERPA compliance of the NVIDIA Flare and PySyft federated learning frameworks for educational applications.

- **Performance Benchmarking Dataset**

The research will provide a comprehensive performance benchmarking dataset for future federated learning research in the education domain, enabling researchers to evaluate and compare different privacy-preserving machine learning approaches.

- **Open-source Framework Toolkit**

The project will deliver an open-source framework toolkit and selection guidelines to help educational institutions choose the appropriate federated learning solution for their unique needs, promoting widespread adoption of remote data science techniques.

By embracing remote data science techniques, this project empowers universities to collaboratively enhance student success and uphold FERPA compliance. We invite faculty and students to join us in this innovative endeavor that aims to improve student retention and transform the educational experience.

