Adaptive and Intelligent Learning Systems

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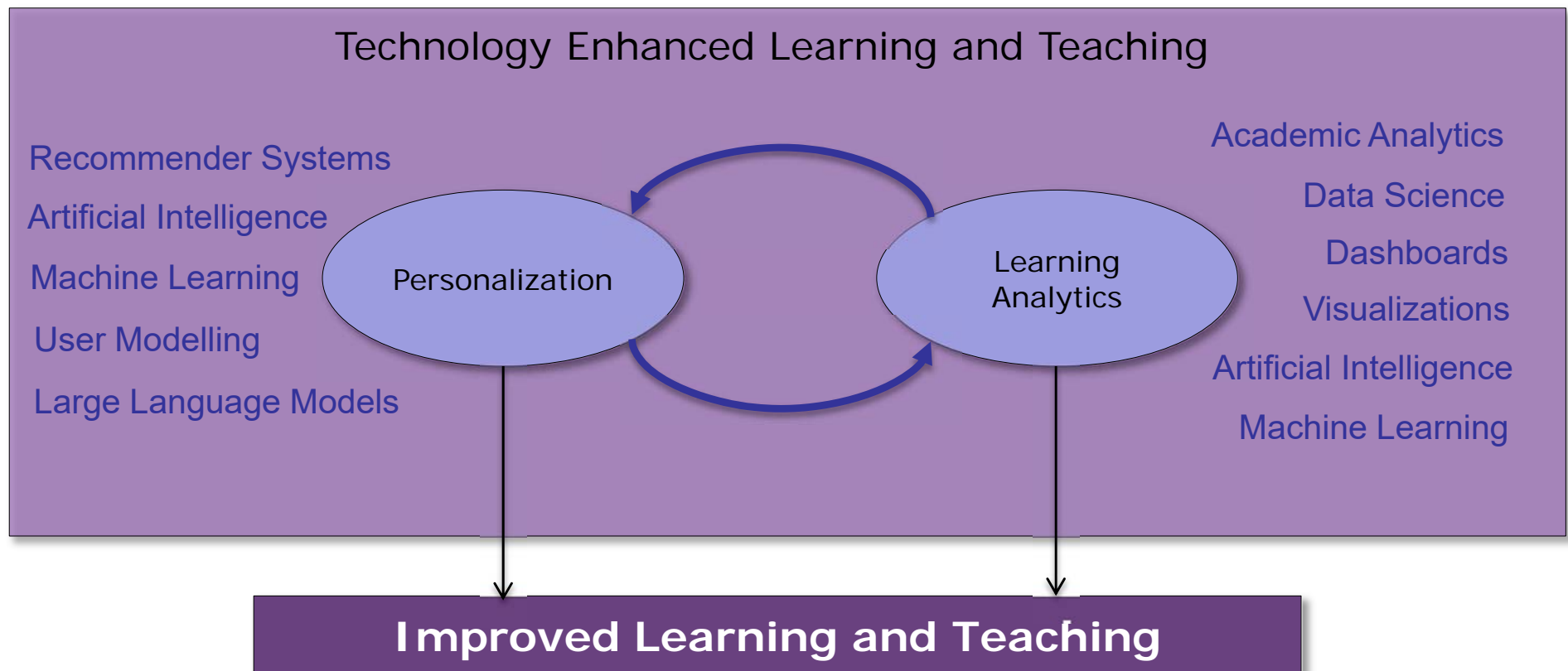Richard Jacklin (RA)
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Research Areas

How can we make learning systems more adaptive, intelligent and personalized?

Technology Enhanced Learning and Teaching

Recommender Systems

Artificial Intelligence

Machine Learning

User Modelling

Large Language Models

Personalization

Learning Analytics

Academic Analytics

Data Science

Dashboards

Visualizations

Artificial Intelligence

Machine Learning

Improved Learning and Teaching

Goal 1: Identifying and predicting comprehensive information about users and learning environments

- Learning styles/preferences

- Cognitive abilities

- Motivational aspects

- Risk levels for failing or dropping out of a course

- Risk levels for dropping out of an educational game

- Player profiles for an educational game

- Successful and unsuccessful behaviour patterns of learners

- Successful and unsuccessful behaviour patterns of educators

Designing and evaluating intelligent and adaptive algorithms and mechanisms

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Goal 2: Design and evaluate intelligent and adaptive algorithms and mechanisms that use such comprehensive user information to provide personalized recommendations, individual learning paths, and adaptive interfaces.

- Learning styles/preferences, cognitive traits, motivation aspects
- Effective collaboration for group work
- Recommender systems
- Personalized interfaces within an educational game
- Large language models to guide learners when answering questions
- Large language models to create content for personalization

Advancing techniques for learning analytics

Goal 3: Advance techniques for learning analytics to analyse and visualize learners' behaviour data in a system and provide decision makers (i.e., students, educators) with actionable information

- Intelligent systems for educators providing information and recommendations regarding
  - course quality
  - students' progress and characteristics
  - students' at risk of failing or dropping out of a course
  - students' successful and unsuccessful behaviour patterns
  - educators' successful and unsuccessful behaviour patterns
  - feedback to students
- Intelligent systems for educators allowing easy access to educational log data