Research Assistant Opportunities
Casual Positions

Automatically Identifying Behaviour Patterns of Learners and Educators that Lead to Learners' Success, Failure, or Dropout

Start Date: June 2022 onwards

Overview:

These positions are in the areas of data science, data analytics, data mining and user modelling in the domain of education.

Most learning systems like Moodle and Brightspace store comprehensive log data about students' and educators' behaviours and actions. While one of the big challenges of online learning and teaching is to get feedback about how learners learn to help them improve their learning strategies and help educators to improve their teaching strategies, those data from such systems are rarely used. However, by combining novel techniques in data science, data analytics, data mining and user modelling, comprehensive information about learners' and educators' behaviours and actions can be retrieved and translated into relevant knowledge about how to improve learning and teaching strategies.

This project is part of the MERID research program. The MERID research program aims at mining educational data to provide intelligent information and personalized recommendations in learning management systems. In particular, this research program focuses on identifying and providing intelligent information and recommendations based on (1) effective and ineffective behaviour patterns of learners (i.e., learning strategies); (2) effective and ineffective behaviour patterns of educators (i.e., teaching strategies); and (3) risk levels of learners for dropping out or failing a course. As outcome, it aims at designing, implementing and evaluating plugable open-source software solutions that (1) provide learners and educators with current information about their effective and ineffective behaviour patterns in online courses as well as learners' personal risk levels to drop out or fail a course, (2) provide personalized recommendations to learners on how to avoid ineffective behaviour patterns and replace them with effective ones and (3) provide personalized recommendations to educators on how to avoid their ineffective behaviour patterns and replace them with effective ones.

This research program will advance research in user modelling, learning analytics, and personalization by combining techniques from those areas to provide learners and educators with complex information about their behaviour in online courses and whether it leads to learner

success, failure or dropout. Such information is highly relevant for learners and educators to improve their learning strategies and teaching strategies and therefore, improve learning overall.

This project is part of the MERID research program and focuses specifically on **identify, predict, and visualize complex information about users** (i.e., learners and educators). As such, the following three objectives will be worked on:

- Objective 1: identify and visualize simple and complex behaviour patterns of *learners* that lead to success, failure, or dropout of a course.
- Objective 2: identify and visualize simple and complex behaviour patterns of *educators* that lead to success, failure, or dropout for learners.
- Objective 3: predict and visualize risk levels of learners for failing a course or dropping out

We are looking for several **Master students and undergraduate students**. Successful candidates will be working under the supervision of Prof. Sabine Graf at Athabasca University.

While we will be **working on this project as a team**, every student will have a concrete topic in this project. Concrete topics will be decided based on the interest and skills of the student. Such topics may include the following tasks (but not every student will work on each of those tasks):

- Extending existing work or starting to work from scratch
- Conducting literature reviews
- Creating theoretical models and frameworks on how to combine different techniques and approaches
- Building, running and improving artificial intelligence, computational intelligence, data mining, and machine learning algorithms
- Conducting simple or comprehensive data analysis
- Developing open-source solutions (e.g., Moodle plugins)
- Evaluating those plugins/systems with real users (i.e., students or educators)
- Write and publishing academic papers
- Present academic papers at conferences
- Draft funding proposals

As a successful candidate, you will gain valuable knowledge and skills in the broad areas of data science, data analytics, data mining, user modelling, software development, human computer interaction, and visualization. You will be provided with an environment where you will be able to work as a team on a larger project, discuss with and get feedback from other students about your work, and share experiences. All skills acquired will be professionally transferable.

Eligibility and Qualifications:

- You have to be enrolled in Athabasca University's MSc IS program or any undergraduate program.
- You have to be located within Canada
- You have to have completed at least half of your study program
- You have to be interested in this project

How to apply:

Eligible candidates are encouraged to submit their application by email to Dr. Sabine Graf (sabineg@athabascau.ca). Applications should include:

- a cover letter that summarizes your skills, interests and experience as well as describes **what objectives and kind of activities and tasks (see above) you are most interested to work on** and what qualifies you to work on those tasks.
- a current resume or curriculum vitae
- an unofficial copy of your transcript, and
- the contact information for 2 references

Please submit your complete application latest by **May 9, 2022**, which is the date when we will start to evaluate applications. The call will be kept open until successful candidates are found.

All applicants are thanked for their interest in this position; however, only candidates selected for an interview will be contacted.

Athabasca University and the researchers are committed and seek to support equity in employment and research opportunities. We strongly encourage applications from Indigenous people, people of colour, people with disabilities, 2SLGBTQ+ people, women, and other historically marginalized groups. Applicants are welcome, but not required, to self-identify in their letter of application.

If you have any questions, please contact Dr. Sabine Graf at sabineg@athabascau.ca.