Athabasca University
FACULTY OF SCIENCE & TECHNOLOGY
School of Computing & Information Systems

The future of learning.

Opportunity to Receive an
NSERC Undergraduate Student Research Award
for a 14-16 Weeks Full-Time Research Assistant Position

Project Title:
Language Models for Generating Educational Questions and Feedback

Start Date: Begining of May 2026

Project Overview:

This position is in the areas of language models, generative artificial intelligence (AI), educational technology, and software development.

Educational questions have been long used by instructors, dating back to Socrates, to promote learning through encouraging discussion, stimulating curiosity, and guiding problem solving. Asking effective questions has been called one of the most effective single educational acts that an instructor can undertake due to its power to impact students' learning. While answering questions has clear benefits for learners, creating meaningful, engaging, and pedagogically sound questions is a significant amount of work for teachers and as such, the power of asking questions is often not used or only used in a limited form in educational settings. Similarly, providing students with proper feedback is very important for their learning process but again, it is very time consuming to provide personalized feedback to students, even when it is just about answering short questions.

Language models (LMs) are a novel emerging technology capable of generating different media, including text, from a descriptive prompt. Some research has been done on using LMs to generate educational questions and feedback, however, the resulting questions and feedback have several issues such as: 1) insufficient quality to be directly usable 2) limited alignment with pedagogical frameworks, 3) unengaging, and 3) not aligned with courses' learning objectives.

In this NSERC USRA project, you will focus on two themes: (1) designing, developing, and evaluating a language model for generating meaningful, engaging, and pedagogically sound questions and (2) designing, developing, and evaluating a language model for generating personalized, pedagogically sound feedback to students' short answers on questions.

As such, you will focus on the following tasks:

- Design and development of self-correcting architecture and retrieval-augmented generation for a language model using Python.
- Development and execution of test cases.

- Data analysis of the results from test cases and the execution of the language model.
- Writing scientific papers about the conducted research.

NSERC USRA is a funding program that aims at supporting undergraduate students to conduct research activities. For more information on the program, please visit the official website at: https://www.nserc-crsng.gc.ca/students-etudiants/ug-pc/usra-brpc_eng.asp

We are looking for **one candidate for an NSERC USRA** to become a full-time research assistant for 14-16 weeks. The successful candidate will be working on this project under the supervision of Prof. Sabine Graf.

The successful candidate will gain valuable knowledge and skills in the broad areas of language models, generative AI, educational technology and software development. In addition, the successful candidate will acquire hands-on learning and research skills through fine-tuning and improving a language model, analyzing and evaluating the results of the model, and disseminating research findings at international conferences and/or journals. They will also gain experience in team work as well as communicating with diverse audiences, including other academics and team members. In addition, they will get familiar with working in a research environment and presenting significant achievements to team members, other students, and academics. All skills acquired will be professionally transferable.

Qualifications:

- Enrollment in an undergraduate program in Computing and Information Systems, Computer Science, Information Systems or a related field
- Strong programming skills (e.g., Java, C++, Python, etc.), with a preference on Python
- Knowledge on language models and techniques to fine-tune and improve them is an asset
- Strong logical reasoning and analytical skills preferred
- Good communication skills
- Ability to work independently and reliably, as well as ability to work within a team

Eligibility:

Please see the eligibility requirements on the NSERC USRA website (see: https://www.nserc-crsng.gc.ca/students-etudiants/ug-pc/usra-brpc_eng.asp#a2)

Details about the position:

Duration:	16 weeks (could be reduced to 14 weeks based on the candidate's preference)
Hours per week:	35 hours per week (full-time)
Start date:	Begining of May (exact date can be negotiated)
Location:	The position can be done remotely from anywhere in Canada
Pay (16 weeks):	$17.51/hr

This position is a good opportunity to get involved in research activities and might later lead to your undergraduate project topic or the possibility to keep working on the overall project as part-time research assistant.

How to apply:

Qualified and eligible individuals are encouraged to submit their application by email to Dr. Sabine Graf (sabineg@athabascau.ca). Applications should include:

- A cover letter (max. 1 page) that includes:
    - Why you want to undertake this research project;
    - How the research contribution and experience will advance academic or professional plans upon completion of your undergraduate degree;
    - Qualifications (e.g., education, experience, leadership roles, etc.) for this research award;
    - Previous awards and scholarships, if applicable;
    - Publications and presentations (i.e., talks, posters) or other forms of knowledge creation and transfer, if applicable; and
    - Additional research experience to date, if applicable.

    An additional page should be used to describe the following, if applicable:
    - An explanation for any course withdrawals and/or lower transfer credits and/or semesters of study with less than 5 courses, if applicable; and
    - If you have taken a full course load (5 courses/semester) and would like to explain exceptional circumstances that may have negatively impacted your GPA, you may do so.
- A current resume or curriculum vitae (CV)
- A list of eligibility requirements including a short description on whether/how you meet each requirement (see: https://www.nserc-crsng.gc.ca/students-etudiants/ug-pc/usra-brpc_eng.asp#a2)
- an official or unofficial copy of your transcripts from your current studies (it is okay to submit an unofficial copy at this point but if successful, an official transcript is needed latest by March 23, 2026)

Please submit your complete application latest by **March 14, 2026.**

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.

For more information on this NSERC USRA Opportunity, please contact Dr. Sabine Graf at sabineg@athabascau.ca.