

Undergraduate Mentorship Program

Let's SOLVE it! Application Information documents

Thank you for your interest in our undergraduate Mentorship Program “Let’s SOLVE it!”

You will find in this information package everything you need to know about this program, what to prepare to apply and other frequently asked questions.

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Got questions not covered in this document? E-mail us at mi.research@borealisai.com.

Call for applications

Overview of the Program

Borealis AI, Royal Bank of Canada's AI Research Institute, is launching a mentorship program aimed at providing undergraduate students from diverse geographical locations and universities from across Canada an opportunity to gain industry exposure and networking experience by working closely with members of the Borealis AI team.

As part of this mentorship program, Borealis AI is inviting teams of undergraduate students to work on projects aimed at using Artificial Intelligence (AI) and Machine Learning (ML) to help their community. Selected teams will formalize their submitted project proposals and work with Borealis AI mentors to make them a reality, thereby allowing selected teams to access leading Machine Learning talent to tackle the challenges of their community, while also learning about career opportunities in a thriving industry.

A. Application criteria & eligibility

This mentorship program is open to teams of 3 to 5 undergraduate students currently enrolled at a Canadian university.

All team members must meet the following additional criteria:

- Team members must be enrolled in an undergraduate program in a Canadian University during the duration of the mentorship program
- Each team must have 3 to 5 students
- Team members must not be current or past fellows with Borealis AI.
- Each team member must be able to dedicate 10 hours each week to this project between **October 1 – December 2, 2021**, including one 1-hour team meeting and one 30 min meeting with their Borealis AI mentor each week.
- Each team must have common availability for at least 2 hours from Monday-Friday 9.00am to 5.00pm in EST time zone for the duration of the mentorship program.

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- Each team must be available for the Welcome Day Event (**October 1, 2021 from 12:00 pm to 2:00 pm EST**) and the two Presentation Days at the end of the program (**December 1, 2021 and December 2, 2021 from 12:00 pm to 4:00 pm EST**)
- Each team member must have some basic knowledge or experience in programming, including but not limited to:
 - A personal coding project;
 - Participation in a coding competition (i.e. hackathon, bootcamp, kaggle or other); and/or
 - An introductory undergraduate or high school programming course.
- Each team member must have access to a web-accessible laptop or computer.

Questions? Check out our FAQ section about the eligibility criteria [here](#)

B. Program components & expected outcomes

During the two-month remote mentorship program, selected teams will have the opportunity to collaborate with Machine Learning Researchers, Engineers, and Product Managers. Together, the selected teams and Borealis AI mentors will expand the initial proposal into a formal white paper, complete with a proof-of-concept implementation.

During the term of the mentorship program, selected participants can expect:

1. *Industry exposure.* Team members will receive guidance from, and access to, a diverse group of industry experts at Borealis AI.
2. *Mentorship.* Several Borealis AI team members will work closely with each student team to help them formulate their Machine Learning proposal and provide advice on future career opportunities.
3. *Contacts.* Each team member will be provided with the opportunity to network and build connections with industry experts in Machine Learning and programming, which can help participants as they chart a path forward in their professional life.
4. *Training.* In addition to direct technical guidance from their mentors, team members will receive general guidance and training to help them progress through a curated selection of the best public resources for personal education in Machine Learning and programming.

The final outputs of the mentorship program will include:

1. *A summary talk.* A final team presentation to an audience of Borealis AI team members and selected industry experts outlining the work undertaken and the proposed path forward.
2. *A one-page summary.*
3. *A public code repository.* Storing any tests or proof of concepts from the project.
4. *A white paper.* (Optional) An expanded, formal treatment of the original proposal with a precise plan for how Machine Learning can be used to help solve the problem outlined and what work is required to make the solution a reality.

C. How to apply and what to prepare

Teams of 3-5 student applicants must submit one group application by **11:59 PM EST on August 29, 2021**. Each team can submit up to a maximum of 3 proposals.

- Please gather the following materials in order to proceed with your application. You will not be able to save the application once you start. Select one of your team members to be the main contact (refer [here](#) to learn more about the main contact's role)
- For each team:
 - Proposed team name
 - A proposal of 500-1,000 words outlining:
 - The problem your team would like to solve;
 - Why that problem is important to your team and/or your community;
 - Why your team believes Machine Learning could help solve this problem; and
 - What it will mean for your team to be admitted to this mentorship program.
- Please also tell us if this project is related to a personal, extra-curricular project you have already been working on, or if it is part of coursework you have to do for one of your university classes.
 - Please see our sample proposal [page 9](#)
- For each team member:
 - Valid contact information
 - General information
 - Educational background

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- Skills/interests in computer science
- Proof of enrollment and year of study at a Canadian university for each team member (latest transcripts, letter of acceptance)
- Resume (optional)

Questions? Check out our FAQ section about the application process [here](#)

D. Selection process

A total of eight teams will be selected from various Canadian universities. Shortlisted applicants will be contacted by **September 10, 2021** to arrange a short and informal virtual interview to determine fit and eligibility. Virtual interviews will take place between **September 6 and September 13, 2021** and final decisions will be communicated to selected participants by **September 17, 2021**. Selected participants will be asked to sign and return a student participation agreement by September 17, 2021 to be officially considered part of the program.

Questions? Check out our FAQ section about the selection process [here](#)

E. Other matters

1. All members of selected teams will receive a participation token in the form Borealis AI-branded swag items or a virtual gift card issued in Canadian currency (a “**Participation Token**”). All characteristics and features of each Participation Token are at Borealis AI’s sole and absolute discretion. Limit of one (1) Participation Token per team member. Borealis AI reserves the right, in its sole and absolute discretion, to substitute a Participation Token with a token of equal or greater value. No substitutions are permitted, except at Borealis AI’s option.
2. Borealis AI reserves the right to modify any portion of the mentorship program or to cancel the mentorship program for any reason whatsoever.

More questions? Check out our Frequently Asked Question section [here](#)

FAQ

Eligibility

Do I need deep ML knowledge to apply to the mentorship program?

ML knowledge is not required to apply but you do need to be interested in learning about ML.

I'm interested in the program, but I don't have a team.

Only team applications are eligible. Teams can be made up of students from different programs and at different Canadian universities. So, think broadly about how you build your team.

Our team has only 2 members or more than 5 members.

If your group has 2 members or 6 members, you can still submit your application online but you need to explain why your group doesn't have the required number of people. Group of more than 6 people are not eligible to this mentorship program.

My team members are all from different universities.

While all of your team members must be enrolled in a Canadian university for the Fall semester of 2021, they don't necessarily have to be studying at the same university.

Our team members do not know their weekly availability as our university has not yet published the Fall classes schedule.

You can still submit your team application and mention this in the "Additional comments" section. Please keep in mind, however, that if you are selected for the program, your team must have availability in common for at least 2 hours from Monday-Friday 9.00am to 5.00pm in EST time zone for the duration of the mentorship program. In addition, all team members must be available for the Welcome Day Event and the two Presentation Days at the end of the program.

My university classes are currently virtual, so I'm currently outside of Canada.

The program is entirely virtual. As long as you are enrolled in a Canadian university and you are able to attend the weekly team meetings with your mentor, the Welcome Day Event and the Presentation Days, you are eligible to apply.

We may use this team project for a course at our university.

You can still submit your application, but please give us as much information as possible about how you intend to use the project in the applicable section of your team application. Your application will be reviewed separately, taking into consideration the explanation you provided.

I would like to join 2 teams.

You can apply with a maximum of 2 different teams. And, if both are selected to attend Borealis AI's mentorship program, you will be asked to decide which team you want to be part of. However, if one of the two teams do not meet the requirement for the minimum or maximum number of team members (3-5), then the decision will be made by the Borealis AI selection committee.

Application process

What is the role of the main point of contact?

To avoid multiple email exchanges, we ask that one of your team members becomes the main point of contact for the whole team. The rest of the team members should be cc'ed on all communications. We ask, however, that only the main point of contact replies to our e-mails for confirming interviews and other team matters.

What happens if our team application is short-listed?

If your team moves to the second part of the selection process, Borealis AI will reach out to your team's point of contact to schedule an informal chat between your team and a Borealis AI team member. During this informal chat, you can provide more details about your proposed project and the technical experience of your individual team members. Here are some example questions to think about:

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- Why did you choose this topic?
- Do you know what data you can use for your project?
- How do you describe your programming skills?
- Do you have experience with ML?
- What do you expect of the Let's SOLVE it Program?

Ideally all your members should be available for the informal interview. If that is not possible, then at least half of your team must take part in the interview.

When can we expect to hear back from Borealis AI?

All teams that submit an application will be notified around September 15th, 2021. If you are not selected this time around, you are welcome to apply again in any of the following cycles of the mentorship program.

The Program

What is the Welcome Day event?

Welcome Day is the first day of the program (for this fall 2021 program, Friday, October 1st). During this 2-hour virtual meeting, we will introduce all participant teams, their affiliated university, project and mentor. We will also share important information such as how to get in touch with your mentor, what workshops we scheduled during the program and what outcomes you can expect.

What is the Presentation Day event?

Presentation Day is the end of the program. All teams will present the project they have been working on during the mentorship program. Presentation Day will very likely be divided into 2 half days (12-4 pm EST). However, even if your team does not present during one the day, all teams need to attend. The team presentations will be followed by a virtual appreciation party.

Project Proposal – Forecasting of Needs for Food Banks

What is the problem?

Food banks are an essential societal resource dedicated to providing support to citizens experiencing food insecurity. By providing food and other essential goods, it significantly reduces the number of people suffering from hunger or other tough situations resulting from economic inequality. In Metro Vancouver, the Greater Vancouver Food Bank is providing help to approximately 8,500 people across Vancouver, Burnaby, New Westminster, and the North Shore each week. Of all the individuals accepting assistance, 24% are children or youth, and 18% are seniors. Thus, a highly-effective and efficient food bank is of great importance.

With seasonal and economic changes, the need for different food and essential goods shifts accordingly. However, the current food bank setting struggles with foreseeing the change in needs. As a result, the discrepancy between goods needed and the goods food banks have on hand increases. This causes insufficiencies and reduces the number of people that can be helped. The current solution is to put up posters in grocery stores, etc. to remind people what is needed. Even though it is effective to some extent, it still creates a lag between what is in need and what can be provided by local communities.

Assuming we have access to data from food banks, we believe it would be beneficial if we can predict what will be in need in the coming weeks/months based on the pattern extracted from the past. Having a prediction will allow local communities to prepare in advance and act before any shortage occurs.

Why is it important to me?

I believe in helping people who are in need. Since most cities across Canada already have functional local food banks, the efficiency and effectiveness of such organizations becomes increasingly important. When one of our team members volunteered at a local food bank, they noticed certain goods were out of stock while the quantity of other goods was exceeding demand. Thinking about this problem, we believe it is not because local communities are unwilling to donate goods in high demand, but rather they are not informed about what types of items should be donated to meet the community's current needs.

Having the ability to predict what will be in need can keep local communities informed in a timely manner, and as a result, provide better and more targeted help and support. In other words, the proposed project not only encourages the local community to contribute, but also guides them towards what items would provide the most impact if donated. With everyone working together, food banks could be more effective at maximizing their impact and in time reducing the overall need for food banks.

Why Machine Learning Can Help?

Machine Learning is a way of identifying patterns in data and using them to automatically make predictions. Since the demand for each category of the goods is mostly cyclic, a machine learning model would potentially be able to learn this pattern and provide a more precise prediction of changes in demand.