Guide for Applicants

Dalhousie Faculty of Computer Science PhD Program

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# What **not** do do

DO **NOT** EMAIL HUNDREDS OF PROFESSORS LOOKING FOR A POSITION. Professors can easily recognize—and delete—these generic emails. Read this guide carefully before emailing anyone. You need to contact potential supervisors in just the right way to be taken seriously.

*International students*: your top priority should be applying for entrance scholarships. If you get an entrance scholarship, it will be easy to find a supervisor. If you get accepted to the program but don't get an entrance scholarship, it is extremely difficult to get a scholarship afterwards.

# Why Dalhousie?

Here, you will find a supportive, inclusive, multicultural environment for realizing your full potential. The PhD program will provide you with a world-class education, tailored to your strengths and goals. Whether you want to be a professor, a researcher, a teacher, an entrepreneur or seek a more conventional career, we want to help you reach your goals.

Dalhousie is one of Canada’s U-15 research-intensive universities. The Faculty of Computer Science has over thirty professors doing groundbreaking research in areas including:

* Artificial intelligence and machine learning
* Big data
* Bioinformatics and algorithms
* Computing education
* Computer and Information Security
* Human-computer interaction
* Software engineering
* Systems and networks
* Visualization and graphics

Throughout the PhD program you will benefit from extensive mentoring, a collaborative lab culture, strong industry links and competitive stipends. You will enjoy opportunities to teach and mentor others. Those intent on an academic career will receive coaching and help with professional networking. Those intent on an industry career path may have opportunities for internships or close collaboration with industry partners.

Funding is available to both domestic and international students. Dalhousie has a generous funding program for graduate students. It’s one of just five Killam Trusts Universities and awards over $24 million in scholarships each year. Domestic applicants and applicants from underrepresented groups will be given priority. There are many different funding sources. You can get a better stipend by carefully reading this guide and applying for multiple awards.

Halifax, meanwhile, is a picturesque port city with high quality of life and moderate living costs. [We enjoy a wide variety of restaurants, parks, water sports in summer, snow sports in winter, and a passable public transit system](https://discoverhalifaxns.com/). Halifax is very family friendly with a great library system, lots of kids programs, and a plethora of playgrounds and parks. [Nova Scotia is home to many beautiful communities, campgrounds, trails, lakes, rivers, lighthouses and opportunities for running, hiking, cycling, ATVing, boating and generally exploring the great outdoors](https://www.novascotia.com/).

# Eligibility

[The official admission requirements are available here](https://www.dal.ca/faculty/gradstudies/graduate-programs-admissions/admission_requirements.html). Realistically, however, we get many more qualified applicants than we can accept. Students who meet all of the following criteria are likely to be accepted:

* You have **a first class Master's or bachelor's degree (with honours)**—whatever "first class" means at your university—in computer science, software engineering, computer systems engineering, information systems or a similar discipline.
* You have a **GPA of at least 3.7 out of 4.3** (approx. 3.4/4 or 8.6/10 or 17/20)
* You are a native English speaker or have one or more of the following:
  + a degree taught completely in English,
  + IELTS all categories 7 or higher,
  + TOEFL 95 or higher,
  + a similar score in MELAB, CanTest, CAEL, or PTE academic.
* You have **one or more peer-reviewed publications** in respectable scholarly venues

You do **not** need to take the GRE. You **do** need strong reference letters. A strong CV with industry experience and a history of community engagement is not required but it helps.

### Exceptions

We make exceptions to these criteria under certain circumstances; for example:

* You are a member of an underrepresented group (e.g. African or indigenous heritage, LGBTQ);
* Your grades suffered due to significant mitigating circumstances (e.g., a disability or long-term illness);
* You have a strong record of scholarly, peer-reviewed publications in respectable venues;
* You have exceptional work experience, or community service / social initiatives
* You have your own funding (e.g. from a government agency or your employer)
* Your skills and experience are a very good match for an existing project

# Application Process

You have to apply for both admission and funding separately. The scholarship applications are due **before** the application for admission. (If you already have a scholarship, e.g. from a government agency or your employer, contact [graduate@cs.dal.ca](mailto:graduate@cs.dal.ca) for advice).

The application process is complicated, with many overlapping deadlines. Please refer to the following timeline for help navigating the process. **The most important deadline is for the Harmonized Scholarship Process in December.**

## Application Timeline for September 2022 Start

* September 2021
  + Read through the [faculty profiles](https://www.dal.ca/faculty/computerscience/faculty-staff.html) and [current opportunities](https://www.dal.ca/faculty/computerscience/graduate-programs/grad-handbook/student-funding/fellowship-opportunities.html) to identify potential supervisors and get an idea of what is available.
  + Choose a topic. Your chosen topic could be one of the current opportunities but doesn't have to be.
  + Write a proposal.
    - Go [here](https://www.nserc-crsng.gc.ca/OnlineServices-ServicesEnLigne/instructions/201/pgs-pdf_eng.asp) and scroll down to "Outline of proposed research." Write a proposal according to these directions. [Format it according to the formatting directions.](https://www.nserc-crsng.gc.ca/OnlineServices-ServicesEnLigne/pdfatt2_eng.asp)
    - See advice below for writing proposals.
  + Email your proposal, CV, unofficial transcript(s) and IELTS/TOEFL results (if applicable) to **no more than three** professors to ask if they would be interested in supervising you. Tell the professor you intend to apply for the harmonized scholarship process (international students) or NSERC CGS-D (domestic students) and ask for feedback on your proposal.
  + If the professor does not respond, assume they are not interested. Do not send reminders.
  + *Domestic Applicants Only:* [Apply for the NSERC CGS-D](https://www.dal.ca/faculty/gradstudies/funding/appprocres/cgsd.html).[[1]](#footnote-1) (More advice below)
* October-November 2021
  + Continue refining your proposal with your prospective supervisor.
* December 2021
  + Apply for the [Harmonized Scholarship Process](https://www.dal.ca/faculty/gradstudies/funding/appprocres/harmonizedapp.html)
  + The deadline is December 23 (unless you want to re-use your CGS-M proposal; then it's around Dec 1)
  + Domestic students can re-use material from their CGS-D application
* January 2022
  + Apply for the PhD program [here](https://www.dal.ca/faculty/gradstudies/graduate-programs-admissions/admission_requirements/admission_process.html).
  + (more advice below)
* March 2022
  + Receive your acceptance letter
  + Notification of HSP entrance scholarships
* April 2022
  + Notifications of NSERC CGS results
* September 2022
  + Begin the PhD Program
  + Domestic students who were unsuccessful in the CGS-D competition apply again.

## How to write a two-page research proposal for CGS or HSP

Consider the following tips for writing your HSP or CGS proposal:

* Read NSERC's directions carefully. HSP uses the same criteria.
* When applying for CGS, follow [NSERC's formatting requirements](https://www.nserc-crsng.gc.ca/OnlineServices-ServicesEnLigne/pdfatt2_eng.asp).
* When applying for HSP, you can use the same material as for CGS but you have to paste it into word-limited fields. Look through the application system so you know exactly what the length limits are. Never-write-like-this-to-squeeze-more-words in because your\_application\_will\_get\_rejected.
* Be as clear as possible. Avoid jargon and acronyms. Don't write for specialists. Explain what you want to do as if talking to your parents.
* Propose "a series of studies"
* Be specific. Demonstrate your knowledge of research methods by explaining exactly how you're going to do what you propose to do.
* Include lots of academic references: scholarly, peer-reviewed articles in journals and conference proceedings.
* Do not neglect the benefits section. Explain how your project is going to change the world.
* Explain how your background (academic and volunteer/community service), your proposed research, and the expected benefits of your research all fit together.
* Get someone to copy-edit your proposal. Proposals full of typos and grammatical errors will not be successful.
* Write three pages and then refine it down to two pages.

A two-page proposal for CGS (or 700 words for HSP) might be laid out as follows. This is just an example; you don't have to follow it exactly.

* Background (2 paragraphs);
  + Paragraph one: define the topic of interest and motivate the proposed research by identifying a specific opportunity to make the world better.
  + Paragraph two: describe what is known about this area. Include lots of references. Make sure it's obvious how your idea extends or departs from existing research, without being overly critical or dismissive of existing research.
* Objectives and Hypotheses
  + One short paragraph for objectives followed by a numbered list of hypotheses or research questions, one per study proposed in the method section
* Method (3-4 paragraphs)
  + Describe a series of three or four interconnected studies (one paragraph per study), such that each builds on the previous
  + Assume you have what you need (e.g. if you need buy-in from an industry partner or a $10,000 piece of hardware, or 100 hours on a supercluster, just assume it's available).
  + Each study should answer one research question or address one hypothesis from the previous section. Begin each paragraph, "To address RQ1, we will…" or "To address H1, we will…"
  + It is usually a good idea for the first question to be about the state of research on the topic of interest, and the first study to be a systematic literature review on the proposed topic.
  + For each study:
    - clearly state the type of study (e.g. a randomized controlled experiment, a questionnaire survey, a case study)
    - If one of your studies involves building something, you need to have some kind of key insight that allows you to build something new.
    - Clearly explain what data you will collect and how you will collect it and analyze it
    - Briefly address the design considerations for the proposed study. For example, if you're doing an experiment with human participants, you might say it was "between subjects, fully crossed design" or a "within-subjects pre-test, post-test design." If you're going to use generative modeling, name the specific technique you will use (e.g. Hidden Markov Models) and state why it's appropriate for this kind of data.
    - Cite published guidelines for doing the proposed kind of study. For example, if you're proposing a systematic literature review, you might cite a book about meta-analysis. If you're proposing to take a Bayesian approach, you might cite a book about Bayesian statistical analysis.
    - Be specific without using jargon. Assume the reader knows what an experiment is but has never heard of your topic.
* Expected contributions (1-2 paragraphs)
  + Describe how the research will (a) contribute to science and (b) help regular people. Don't be modest. Sell the proposal like you're on Dragon's Den. Without being pretentious, explain who will benefit from this work, how they will benefit, and why those benefits will be significant. Don't skimp on this section.
* Conclusion (1 paragraph)
  + Explain why, for this work, Dal’s the right place to do it, you’re the right person to do it (based on your academic background, work experience, volunteer experience, community service, etc.) and your proposed supervisor is the right person to supervise it. Try to tie it all together in a neat little bow so everything about the proposal aligns. For example, if your research was about the programming language Python, you might explain that you contributed to the Python open source project for several years, and that's why you're proposing the project about Python, and you can use your contacts from the Python Software Foundation to get your work into the next release of the language.

Your proposal is not carved in stone. The purpose of this proposal is to show off your enthusiasm, background knowledge, understanding of research methods, and ability to think through a research topic. Most PhD students depart significantly from their initial proposals once they get here, take a few courses and start working with their supervisor.

## How to apply to the NSERC CGS-D competition (domestic students)

Getting a CGS is a very big deal. It really helps set you up for an academic career. You'll receive a larger stipend and have more freedom during your degree. You won't have any trouble finding a supervisor if you secure a CGS-D because it means your supervisor won't have to pay (as much) for you out of their grant.

The deadline is typically around October 1.

You have to submit your application both to the NSERC [portal](https://ebiz.nserc.ca/nserc_web/nserc_login_e.htm) AND [to Dalhousie](https://www.dal.ca/faculty/gradstudies/funding/appprocres/cgsd.html).

You can find NSERC's directions [here](https://www.nserc-crsng.gc.ca/Students-Etudiants/PG-CS/CGSD-BESCD_eng.asp).

This is a lot of work. It cannot be done at the last minute. You have to get transcripts and reference letters and write a lot of text.

You should not ask your prospective supervisor to write you a reference unless they have known you for years.

You have to solicit reference letters through NSERC's website. People write different kinds of references for scholarships than for admissions, so make sure your referees know this is for a scholarship.

## How to apply to the Harmonized Scholarship Process (international and domestic students)

The idea of the Harmonized Scholarship Process is that you submit one scholarship application to the university and are considered for multiple scholarships. (The CGS-D isn't included because it's given out by the federal government). However, the criteria for the Harmonized Scholarship Process are the same as for the CGS-D. The research proposals are basically the same. The reference letters are different.

Most people who apply to the Harmonized Scholarship Process are aiming for the Nova Scotia Graduate Scholarship, which is open to international and domestic students. A small number of top students will win a Killam fellowship. There are several other awards with varying criteria but you don't really need to worry about them because the process is harmonized.

To maximize your chance of winning a scholarship:

* Make sure all of your documents (e.g. transcripts, english test scores) are included
* Give your referees lots of notice. You can't submit until your reference letters arrive
* Write a great proposal

[Apply here.](https://www.dal.ca/faculty/gradstudies/funding/appprocres/harmonizedapp.html)

## How to apply to the Program

1. Start the application [here](https://dalonline.dal.ca/PROD/bwskalog.P_DispLoginNon). Create an account and then create a new application for "Dal Graduate Programs" and fill out the application and submit it.
2. Pay the application fee [here](https://dalonline.dal.ca/PROD/hytwpays.P_StartPage).
3. In 2-3 days, you'll receive an email invitation to our application system, "[gradapp](http://graduate.cs.dal.ca)".
4. In gradapp, add the requested information and Upload your unofficial transcript(s), cs worksheet, statement of research intent, CV, and english test scores (if applicable). Click submit.
5. Your referees (whose information you gave in your application in step 1) will be contacted for letters. Most letters are submitted electronically.
6. When you think your referees have submitted their letters, go back to [gradapp](http://graduate.cs.dal.ca). Your application status should have changed from "submitted" to "under review." If it still says "submitted" it means we are missing something. You should see the filename for each reference letter with the name of the referee so you should be able to tell who has submitted. If a letter is missing, contact your referee and get them to submit it. If you can't tell what's missing or your referees say they've already submitted your letters, then email [graduate@cs.dal.ca](mailto:graduate@cs.dal.ca). Note: the harmonized scholarship process and the application process require different letters. You can have the same people write them, but they have to write two different letters.
7. Once your application says "under review" you should receive a notification from the faculty of computer science within four weeks. If after four weeks you don't hear anything, contact [graduate@cs.dal.ca](mailto:graduate@cs.dal.ca).
8. After you receive the faculty letter, the official acceptance usually comes from the faculty of graduate studies within 2-3 weeks.
9. If you have to apply for a student visa, we recommend including both letters.

You can re-use the same proposal from your harmonized scholarship application but you'll need different reference letters.

If you have any problems or questions with the PhD program application, email graduate@cs.dal.ca

In principle, you can apply for the PhD program as late as April 1 (International students) or June 1 (domestic students) but in practice, you should apply by the end of January. If you win an entrance scholarship, you won't be able to accept it if you're not already accepted into the program, and it takes around two months to get you accepted into the program.

1. If you do not have a masters degree and are applying directly for the PhD program, apply for the [CGS-M](https://www.nserc-crsng.gc.ca/students-Etudiants/PG-CS/CGSM-BESCM_eng.asp). (You can get more years of funding this way). [↑](#footnote-ref-1)