

As a first-generation Canadian and a visible minority, I am well-aware of challenges faced by under-represented and less privileged members of the scientific community and society. Even though my own experience is very different from other minority groups (women, and people who are Black, Indigenous, LGBTQ+), it has made me more empathetic and aware of the challenges faced by them.

The goal of my EDI efforts in the academia is *to empower any interested individual to fully realize their intellectual potentials*. I know that there are many factors hindering the possibility of that fulfilment, including implicit and explicit discriminations, limited access to resources, including mentorship, stereotypical beliefs about one’s capabilities, as well as historical disadvantages. I know that I cannot circumvent them all, but I can help. I explain my efforts by categorizing them into two groups: those related to how I run the Adaptive Agents Lab (Adage), my research lab, and those related to institutions beyond my lab.

EDI Efforts at the Adaptive Agents Lab

I have been conscious of maintaining diversity and ensuring inclusiveness of my research group throughout my career as a PI at MERL, Vector Institute, and the University of Toronto. The group of 25 students who have ever been a part of my team come from 13 countries of origin and nationalities (Canada, Iran, Germany, Turkey, China, USA, Spain, Albania, Morocco, Tunisia, Nigeria, India, Korea), belong to multiple equity-seeking groups, and $\approx 25\%$ of them are women. This is not ideal. For example, even though a quarter of my trainees have been women, better than the average of the male dominated field of computer science, it is not yet near parity. My ideal is to have a research lab that is an unbiased representation of the society. I describe some of my efforts to improve the EDI of my lab.

Equal Opportunities and Resources: I divide my time equally between my students in our individual meetings, and I ensure that trainees all have the opportunity to regularly presents their research work in group meetings. All of my students have equal access to 1000+ GPU cluster at the Vector Institute. If they need, I buy them a new laptop or iPad. I send any new graduate student to a top international conference (e.g., NeurIPS, ICML, or ICLR) in their first year, and afterwards, I support their attendance for any paper they publish.

Recruitment – Broad Advertisement: To promote the diversity of the student recruitment process, I advertise my open positions broadly through multiple channels such as my Twitter account (4900+ followers), ML and RL mailing lists, as well as channels dedicated to minorities, such as Black in AI, LatinX in AI, Queer in AI, etc.

Recruitment – Unbiasing the Selection Process: To reduce my unconscious bias in the recruitment of graduate students, I have designed an objective process for selecting students, inspired from Chapter 21 (Intuition vs. Formulas) of [Kahneman \[2011\]](#). Briefly, I evaluate each applicant along several dimensions including their academic background, relevant courses, research experience, etc. Each dimension gets a score based on a rubric, making this step almost mechanical, hence reducing the chance of unconscious bias. Afterwards, I ask them to read one of my papers or choose a paper on their own, and write a report. If I see a good research match based on their report, I invite them for an interview. I use the same set of questions and record their answers. This process helps with the diversity of applicants who get to the interview stage and admission. For example, in the admission year 2019-2020, among the applicant pool who selected me as a potential supervisor, only 16% identified as women. This percentage improved to 23% of those who were selected for an interview, and 25% of those who got an admission. This mitigated the leaky pipeline issue.

Boosting the Pipeline: I intentionally recruited racially minoritized group in order to boost the pipeline (Rule 7 of [Chaudhary and Berhe \[2020\]](#)). This was done through a special internship program at the Vector Institute dedicated to Black and Indigenous (B&I) students. This recruitment allowed several minority students become a part of an active research environment, which would not be accessible to them otherwise.

I was among a less than a handful of the Vector Institute’s faculty members, out of 35+, who hosted a B&I intern in summers of 2022 and 2023.

EDI Efforts at the Institutional Levels

Vector Postdoctoral Hiring Committee: As the chair of the Vector Postdoctoral Fellowship Hiring committee during 2019–2021, I co-developed a transparent hiring process and paid special attention to hiring of candidates from equity-seeking groups. I encouraged the Vector faculty to champion under-represented applicants and the Vector’s senior management to provide financial incentives for their hiring.

Vector EDI Working Group: I have been a member of the Vector EDI Working group, where we collaborated on initiatives and strategies to foster a more inclusive and diverse environment. The B&I Internship program was an outcome of those efforts.

CIFAR Deep Learning and Reinforcement Learning (DLRL) Summer School: As an organizer of the CIFAR DLRL Summer School in 2018, I spearheaded an effort to improve the diversity of the admitted applicants. As the number of applicants (1000+) was larger than the available spots (less than 200), we had to be selective. The traditional selection criteria was to sort the applicants based on their academic-only scores and select the top ones.

After extensive simulation studies of different selection criteria, I came up with the idea of adding a small bonus based on each applicant’s under-representedness factor to their academic-only score, define a Boltzmann distribution based on that adjusted score, and randomly choose the applicants. The result was very encouraging. The selected cohort consisted of academically strong applicants who were also more diverse: their academic score was 7.2, only slightly lower than 7.8 of the academic-only deterministic selection and much higher than the average 4.2 of the applicant pool, yet being significantly more diverse with having 32% women, compared to 17% of the applicant pool. This mitigated the preferential attachment process (Matthew effect) that has led to various imbalances in the computer science community.

Free Educational for All: Being a member of Adage or a student at the University of Toronto is a privilege limited to a small group of people. That is why I decided to developed a new mathematically rigorous course on [Reinforcement Learning](#), accompanied by textbook [Lecture Notes on Reinforcement Learning](#), and [recorded lectures](#), and release them publicly for free. I have made the [slides](#) and [video lectures](#) of my Introduction to Machine Learning course publicly available too.

References

- V. Bala Chaudhary and Asmeret Asefaw Berhe. Ten simple rules for building an antiracist lab. *PLOS Computational Biology*, 16(10):1–9, 10 2020. [1](#)
- Daniel Kahneman. *Thinking, fast and slow*. Macmillan, 2011. [1](#)