CS-CAN | INFO-CAN

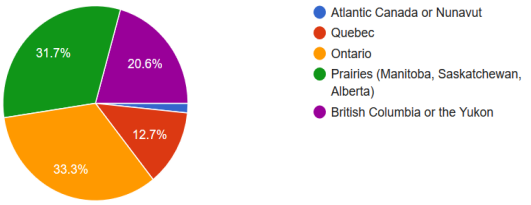
# CRCC Consultation in August-September about New 3-Council Find, Support of ECR and Improving EDI

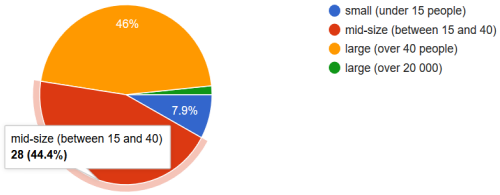
CS-CAN |Info-Can Survey Results summary

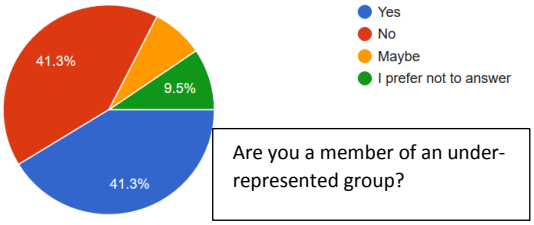
Survey period: August 10 – September 10, 2018

Number of participants invited: over 900; Number of responses: 63 (7%)

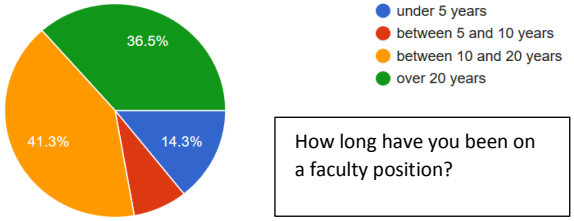
Demographic data on the responders:



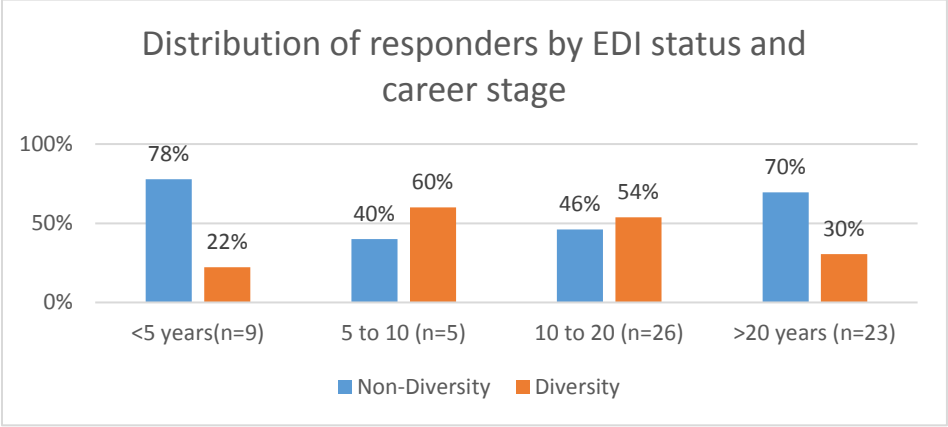




Are you a member of an under-represented group?



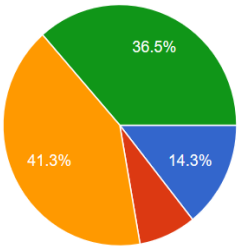

How long have you been on a faculty position?

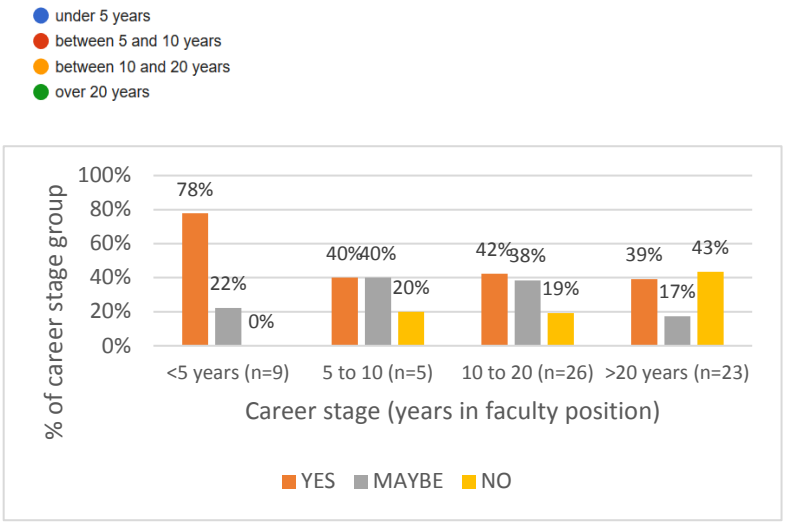


# New Tri-Council Fund Consultation

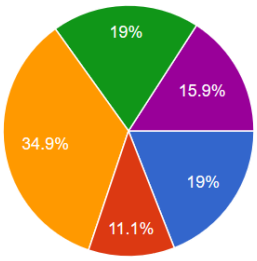
The survey included three closed form questions with possible answers “Yes”, “No” and “Maybe” and “Hard to say” and one open form question inviting comments.
The distributions of answers to the first 3 questions are presented below first – over all responders and second - according to number of years the respondent has been in a faculty position.

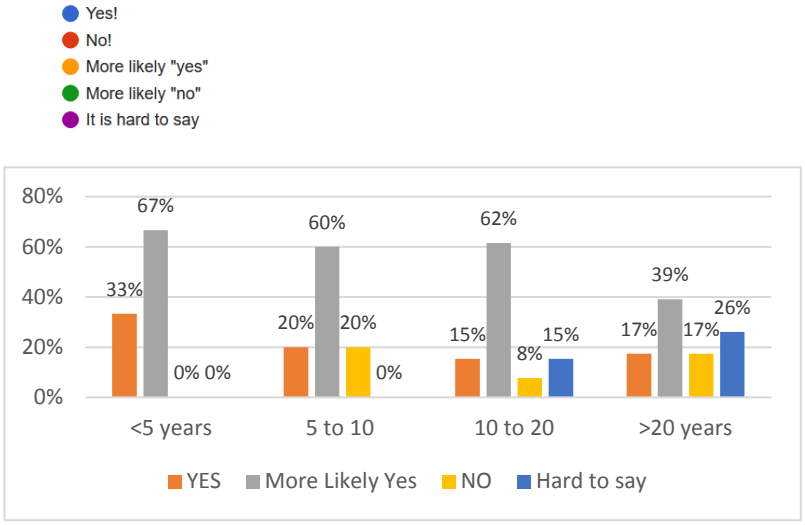
### Will the new 3-agency fund benefit Computer Scientists?



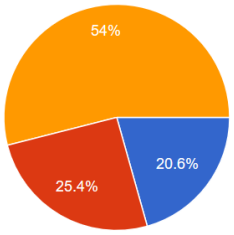



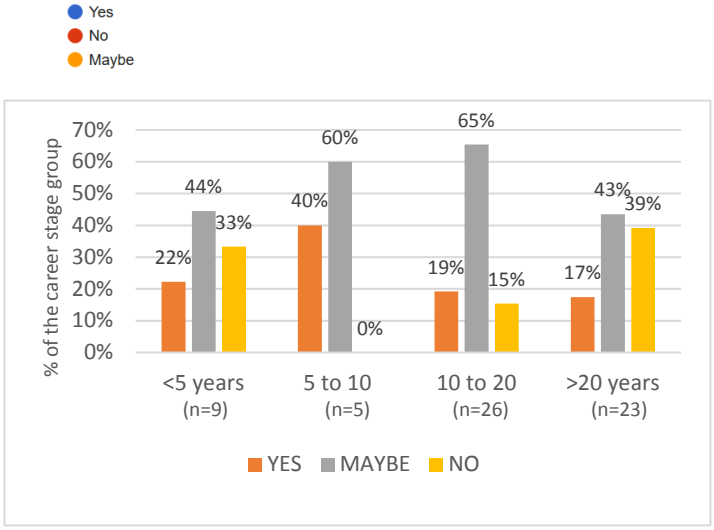

### Do you see yourself applying to the new fund?



**Cancel the NCE Program and Replace with the new fund?**




This section contained also one open form question:

**What criteria could be used in the discipline of Computer Science to identify cutting edge, interdisciplinary, fast-breaking areas where Canada can be a world leader?**

The answers mentioned 3 types of criteria:

| **CRITERIA TO IDENTIFY AREAS FOR TRI-COUNCIL FUND PROJECTS** |
|---|
| **Interdisciplinary** |
| • Every response addressing this question discussed the need for the inclusion of a non-CS field |
| **Cutting Edge** |
| • New Field: 54%<br>  ○ This category usually discussed how the field itself was still being defined |
| • Applicability: 46%<br>  ○ This category often discussed relevance for industry usage and the size of the potential impact |
| • Most/All CS: 15%<br>  ○ This category mentioned that most or all disciplines of CS fall under the definition of “cutting edge” |
| **Canadian Contribution** |
| • Canadian Research Presence: 71%<br>  ○ This category discusses the existence of strong Canadian researchers in the field of question |
| • Canadian Industry Partners: 29% |

| |
|---|
| ○ This category discusses the existence of Canadian industry partners involved either in the development or the application of the technology from the field. |
| • Countries Canada Partners With: 29%<br>○ This category discusses the existence of other countries with strong research programs in the field; specifically, research programs that Canadian researchers can partner with |

**Funding large projects versus spreading funding**

Emphasis on the funding of large projects could be risky and work against diversity of participants and ideas, while "planting acorns" over a more diverse and curiosity-driven set of projects may prove more fruitful. Many examples in CS confirm this e.g. AI in which Canada is a leader was developed mostly through Discovery grant funding of individual researchers, rather than large industry or politically directed projects.

**Cutting-edge versus relevance / engagement with Canadian industry**

Most of the really cutting-edge work in industry where there is not already a strong R&D lab (e.g., Google, MS, FB, etc.) is occurring at the start-up or early ramp level where industry does not have the time or resources to engage well with academic timelines and Tri-Council reporting requirements.

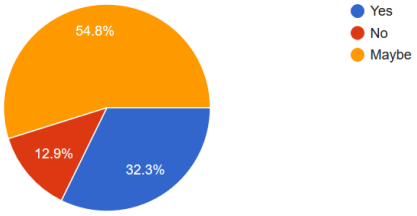
Emphasis on industry relationship for grants that are below the notice of the large tech companies (of which we have very few that would fall into the "Canadian" category), means that academics are going to have challenges finding partners. This is reflected in the feedback about industrial relationships in this survey.

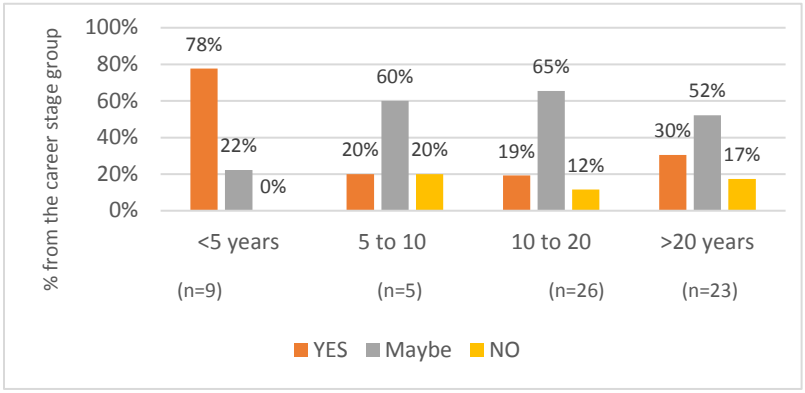
The industrial relationship model needs to be reworked for technology funding. The model that applies in agriculture, mining, oil & gas, and other well-established industrial fields in Canada does not work for an emerging industry. Or perhaps, the model that works in major centres with established tech giants and large communities (e.g., Montreal, TO, Vancouver) does not work as well in smaller centres such as Halifax, Saskatoon, Edmonton, Winnipeg, and St. John.

## ECR Program Consultation

The survey on the proposed ECR program contained one closed form and three open form questions inviting comments, which were analysed for recurring themes. The results are presented below.

**Do you think the proposed action plan to support ECRs would be effective for Computer Science ?**




**What do you think are the biggest challenges facing ECRs in the discipline of Computer Science?**

- Recruitment and Funding of HQP/Students: 35% of responders mentioned this theme
  - This category discusses the difficulty of attaining and keeping HQP; it as often mentioned this is particularly hard for ECRs, considering they have minimum HQP supervision experience
- Networking/Industry Connections: 24%
  - This category discusses how ECRs struggle with a lack of connections; many answers suggested facilitating ECRs connecting with industry and other potentially useful connections (e.g. through awards for young researchers to raise their profile and events)
- Funding Amounts: 26%
  - This category discusses general funding amounts provided to ECRs; the amounts are too low to facilitate start-up of a research lab and hiring of HQP
- Getting Funding as an ECR: 21%
  - This category discusses the difficulty in obtaining funding as a ECR; answers discussed that funding models favour mid- and late-career researchers, who are better able to find other funding sources.

**Are there Alternative Pathways for ECRs in CS:**

- Yes, there are alternative pathways: 59%
  - This category involves those believing alternative pathways for ECRs do exist. Examples – new faculty coming from industry or directly from a PhD. Often these ECRs are missing things that ECRs from the standard pathway have, specifically experience with HQPs (15%) or with typical faculty duties such as grant writing (13%). Another different path is going to industry after PhD and a couple of postdocs. Much of the ECR focus seems to be on ending the cycle of postdocs. This is less relevant for computer scientists who

tend to transition to industry if they don't find a faculty position after a postdoc or two. Many other disciplines do not have that receptor capacity.

- No, alt. paths aren't prominent: 21%
    - This category involves those believing that those coming from these alternate pathways are an insignificant proportion the overall ECR pool.
- Maybe alt. pathways exist: 21%
    - This category involves those that are unsure about the existence of alternative pathways.

**Do you think the proposed action plan to support ECRs would be effective for Computer Science?**

The main themes of 26 comments and recommendations are listed below.

| **POSITIVE POINTS** | |
|---|---|
| | **Improvement of Research Grant Sizes** |
| 1. | Efforts should be made to increase the worth of Canadian Computer Science research grants in general to be as competitive as US's to prevent losses of potential faculty (e.g., postdoc students) to the US. |
| 2. | Increase the amount/quota of discovery grant funding for ECRs, but also for researchers in all career stages, a special concern are mid-career researchers. |
| 3. | Extension of ECR status to 6 years to synchronize with tenure clock. Highly successful ECRs should be allowed to reapply earlier than the usual period to get quicker to a larger grant. |
| | **Human/Technical Resource Development and Sharing** |
| 1. | Setting up and organizing training workshops for grant seeking/writing, especially for junior faculty would be very helpful to help ECR get started. A College of Mentors across universities can help smaller institutions that do not have resources to mentor their ECR in grant writing; also it will help in building relationships and collaborations. |
| 2. | In the areas of grants writing and application, research grants should be broadened to include indirect costs of hiring, training and paying of technical/support staff. |
| 3. | Involve ECR in institutional review of tri-council grants as observers (to avoid overloading them). |
| **POINTS OF CAUTION** | |
| 1. | Increase of ECR funding, e.g. Tier 2 chairs, higher size of DG, should not be at the expense of mid-career or established researchers (15%). There should be a supported environment for the all phases of the career, and one should be able to enter into research whenever in one's career that becomes possible: early-, mid-, or late-career. Resources may not permit constant support, but once-in-a-career support is not unreasonable. |
| 2. | Pillar 2 appears to be angled at PhD students that want to receive professional (company-geared) training while doing a PhD, and this seems inimical to their fruition into a Doctor of Philosophy. There is plenty of time to obtain these skills either before or after a PhD, and one can always do summer internships during a PhD |
| 3 | Pillar 1 is misdirected - emphasis on large projects could be risky and negatively impact diversity of participants and ideas. "Planting acorns" over a more diverse set of projects has proven more fruitful. |
| 4. | Award and receipt of grant for "dirigiste" (non-curiosity-driven) research can be problematic. |

## EDI Program Consultation

The questions in this sections invited free comments regarding the obstacles to EDI in Academia, the specific obstacles in the context of Computer Science, and measures that would be successful. Below is a summary of responses obtained through analysis of re-occurring themes.

EDI Obstacles:

- Lack of Underrepresented Students: 33% of comments mentioned this as a main obstacle
    - This category involves the low number of underrepresented (responses primarily discussed female students) students, and how this translated into worse EDI in academia.
- Perception of CS: 17%
    - This category included people mentioning how the current perception of CS among the general public contributed to issues with EDI; often these responses suggested bringing more visibility to the accomplishments of CS researchers that are members of underrepresented groups.
- Systematic Bias: 17%
    - This category discussed the systematic bias currently present in the academic community; discussion of bias exhibited by members of the community was included in this category.

Obstacles Listed by the Respondents who are Members of Underrepresented Demographics:

- Undervaluing EDI Workload: 41%
    - This category refers to all parts of academia ignoring/undervaluing/not supporting the extra workload that members of underrepresented demographics take on (including mentorship, outreach, and supporting students from underrepresented demographics); this occurs during performance evaluations, distribution of teaching workloads, when deciding whether to fund proposals, applications for grants, and many other categories. This is especially a problem for ECRs that do not hold positions on committees dedicated to this. In short, academics are essentially punished by the system for undertaking activities to improve EDI.
- Existing/Unconscious Bias: 36%
    - This category is the different, but in the comments it was related to the “systematic bias”; it discussed the systematic bias currently present in the academic community resulting from implicit bias exhibited by members of the community was included in this category.

Effective CRCC Measures:

- Outreach/Visibility of Underrepresented Members: 27%

    - This category suggested a focus on emphasising and recognizing the achievement of CS researchers from underrepresented demographics (nomination for awards, publicity, etc.), likely with aim towards improving the public perception of EDI in CS.
- Recognition of Outreach and Mentorship Activities: 20%
    - This category represents recognizing the outreach/mentorship activities that researchers from underrepresented demographics undertake; see "undervaluing EDI workload" in previous category.
- Early Involvement: 20%
    - This category represents implementing measures at an early age to improve EDI, specifically the K-12 range.
- Supporting Programs for Underrepresented Demographics: 20%
    - This category represents creating new programs that support members of underrepresented demographics in CS, as well as continuing current programs.

A more detailed list of the different obstacles and recommendations mentioned in the comments:

| **OBSTACLES** | |
|---|---|
| 1. | Myths and socio-cultural stereotypes in early education, academia, media and industry:<br>- Male profession,<br>- Difficult subject,<br>- Self-defeat due to relative poor performance in Math and CS at earlier education levels. |
| 2. | Systemic bias and practices against underrepresented groups<br>- Belief that CS is beyond the capacity of certain underrepresented groups in terms of valuable (theoretical) research contribution, etc.<br>- Low intakes of underrepresented groups (e.g., females, Aboriginals, etc.) into grad programs to strengthen diversity.<br>- Being risk-averse to hiring underrepresented groups that will strengthen EDI.<br>- Bias in the faculty and university approval of research projects to be submitted to research grant bodies. |
| 3. | Lack of implementation and enforcement of EDI policies due to lack of conviction of the importance of EDI:<br>- at the lower education levels,<br>- at tertiary institutions,<br>- Non-addressing of the Digital Divide in remote and First Nations communities.<br>- Poor and poorly motivated science teachers in elementary/high schools. |
| 4. | Gender imbalance in the CS faculty workforce due to the following:<br>- Unconscious bias against women applicants.<br>- Two-body problem is a major obstacle in the hiring of female faculty.<br>- Lack of research opportunities at the cross-cut of two disciplines that might be more attractive for women than core CS disciplines.<br>- Lack of encouragement and incentives for females in CS at early education levels.<br>- Few role models for underrepresented groups at a young age or lower education levels. |
| 5. | Loss of potential human resources and talents to other countries due to limited academic opportunities and research grants in Canada, e.g.:<br>- Post-doc students lost to the US,<br>- Young faculty (ECRs) lost to the US. |
| 6. | A research culture that privileges the "lone genius" researcher. |

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| 7 | The relatively small amount of funding that computer science gets compared to the size of the discipline means that any small mistakes are magnified. If there were even 20-30% more funding for the discipline as a whole, the current mechanisms could do a lot better addressing EDI simply because there would be a bit of "slack" in the system that could make it easier to promote diversity. |
| **PROPOSED SOLUTIONS** | |
| 1. | Encouraging underrepresented groups to pursue a CS career path at lower education levels, including dispelling the myth that CS is difficult, mainly for males or beyond certain underrepresented groups. Active recruitment and pathways into graduate school for underrepresented group undergraduate students. |
| 2. | Use of quota system to get more underrepresented groups into undergraduate and graduate programs. For example, NSERC USRAs could be enhanced with additional seats for under-represented groups. |
| 3. | Programs similar to UK Athena Swan and USA Advance to incentivize Canadian Institutions to care. |
| 4 | Bring back the NSERC University Faculty Awards to recruit female faculty and help Canadian institutions be competitive against institutions in the States (and help make the hiring of female faculty more attractive to our CS departments). |
| 4. | Creation of enabling environments and opportunities in academia and industry to encourage underrepresented groups such as women for CRC in both tiers, on executive positions in administration, CCRC etc. |
| 5. | Pillar 2 points, such as embedding EDI considerations in research funding policies, selection criteria, processes and systems to enhance participation of researchers from underrepresented groups. |
| 6 | Science research culture needs to change. |
| **Observations** | |
| 1 | EDI is not a monolith. Every subgroup have their own obstacles. One-size-fit-all initiatives will not work well for all groups. |
| 2 | Managing dual-careers – harder for smaller institutions with smaller budgets |
| 3 | Concentrating funding in a small number of highly funded projects will decrease diversity and equity |
| 4 | One thing that can be missed is the distribution of different groups among universities of different sizes, and whether those in smaller universities face even more difficulties because they may end up hiring more of the underrepresented groups |