

Cost-of-Ethics Crisis: Beliefs, Decisions, and Justifications in the Job Searches of Computer Science Students in Canada and the United States

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Abstract

Workplace norms in computer science have received growing attention due to a series of recent ethical scandals. One response has been a push to improve the ethics education provided to computer science students. Evidence for the effectiveness of ethics education remains mixed; some evidence suggests that norms are changing, others point to persistent gaps between stated values and practice remain. In this paper, we explore whether students, who have received some contemporary CS ethics education, are able to effectively apply ethical reasoning to their own decision-making in what is typically the first significant ethical decision of their careers: the job search. Our study examines the ethical decision making of 129 computer science students and recent graduates during their job searches. We find that most students prioritize factors like compensation, location, and workplace culture over ethical and social issues. Even when expressing ethical concerns, respondents often justify taking actions contradicting their moral views through commonly-shared explanations such as desire to make money or the perceived inability to avoid unethical workplaces. This work sheds light on the possible disconnect between the ethics education CS students receive and the decisions they make during their job search. We offer insights for evolving curricula to better address practical ethical dilemmas, and encouragement to reproduce the study on a larger scale.

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Introduction

“I literally will take an internship from Satan if it means I don’t go homeless.” – survey respondent

The increasing digitization of nearly every aspect of modern life has brought the ethics of computing into the spotlight. High-profile scandals – from the misuse of personal data at scale by platforms (Wylie 2019) to the deployment of biased facial recognition systems (Cook et al. 2025) – have made clear that current norms are insufficient to ensure that the computer science (CS) workforce acts responsibly and produces positive societal outcomes (Kumar et al. 2024). While multiple professional codes exist (e.g., ACM’s Code

of Ethics and Professional Conduct (Anderson 1992; Gotterbarn et al. 2018), ABET accreditation standards (Commission et al. 2004), and others (Australian Computer Society 2024; BCS, The Chartered Institute for IT 2024; Institute of IT Professionals New Zealand 2024)), many critics believe they are too abstract to be able to drive real change in decision making (McNamara, Smith, and Murphy-Hill 2018; Gogoll et al. 2021). Researchers have similarly enumerated over 50 ethical principles specific to AI (Munn 2023), but criticisms range from being too abstract (Zhou and Chen 2023) to being “*meaningless, isolated, toothless and adher(ing) to industry’s agenda*” (Munn 2023).

In response, there has been a growing push to improve both the quantity and the quality of ethics education provided to CS students (Fiesler, Garrett, and Beard 2020), premised on the assumption that better ethical training will translate into more ethical behavior, decision making, and improved societal outcomes. To address these issues, educators have been actively trying to embed ethics into more technical CS courses, as well as updating their CS curricula to include more ethics courses (Skirpan et al. 2018; Horton et al. 2023; Stavrakakis et al. 2021; Horton et al. 2022; Brown et al. 2024). We use the term “ethics” broadly, following past work (Stavrakakis et al. 2021; Sarder and Fiesler 2022), to encompass computing ethics, information ethics and related fields as well as concepts like social responsibility and justice.

Yet evidence that this educational push is working remains mixed. On one hand, some CS practitioners have taken ethical concerns seriously: most AI developers, when asked, now affirm that ethics is central to their work (Vakkuri et al. 2019), and students have confronted companies from Facebook to Lockheed Martin and Chevron in interviews and career fairs (Rodriguez 2019; Flores and Pearce 2024) with more difficult, ethics-oriented questions. On the other hand, studies consistently report a gap between stated values and practice. When studying the priorities of engineering students at 4 different colleges, Cech (2014) noted that “*public welfare concerns are not highly valued in students’ professional identities as engineers*.” Students self-report that they often found lessons from ethics courses difficult to apply to their own work (Abraham et al. 1997), a finding which has been corroborated by others (Reidy 2017; Oliver and

McNeil 2021). US and Australian data science curricula often fall short of equipping students for real ethical decision making (Oliver and McNeil 2021) and tend to emphasize rule-following over broader societal responsibility (Gorur, Hoon, and Kowal 2020; Abdurrahman et al. 2023; Schiff et al. 2021; Papak, Gupta, and Turpen 2018). A follow-up study by Vakkuri et al. (2020) of AI developers at startups found that, despite agreeing that AI ethics was theoretically important, it was not relevant to them during early-stage development.

We conceptualize the job-seeking process as the first real-world site where ethical commitments are enacted, negotiated, or set aside – making it a uniquely revealing lens through which to study how ethics education is translated into actual behaviour. Previous studies of the effects of ethics education have several limitations. We believe asking workers whether they care about ethics is insufficient, as it fails to capture the complexity of contextual decision making. An individual’s commitment to ethics may be relative to other competing priorities. Furthermore, self-reported attitudes may not accurately reflect actual behaviour, making a comparison between stated beliefs and actions a more informative approach. Lastly, the specific decision-making processes and rationales used during actual ethical conflicts, as opposed to answers to hypothetical questions, can provide valuable insights into the effectiveness of current ethics education, and may inform future curriculum development. To that end, we pose the following research questions:

- **RQ1:** What is the relative importance of ethical considerations compared to other factors (e.g., compensation, work-life balance, etc.) during the employment search?
- **RQ2:** Which specific ethical issues are most concerning to students?
- **RQ3:** How do students rationalize working for companies involved in activities they find ethically concerning?

To answer these questions, we surveyed CS students in Canada and the United States who were actively seeking employment. Participants ranked job considerations, identified companies they had applied to, identified their most pressing ethical concerns, and explained their reasoning when those companies’ records conflicted with their stated values. Our analytic interest is not in passing judgment on these choices, but in examining the structure of the justifications students offer – and what those justifications reveal about the reach and limits of current ethics education. This work speaks directly to CS ethicists’ interest in the human and organizational factors that shape whether ethical commitments in computing translate into practice. The students in our study are tomorrow’s CS workforce – the values they bring to their jobs will influence the technologies they build and the broader culture of the industry (Shen et al. 2021).

Our paper makes the following contributions: For a small sample of job-seeking CS students, we:

1. Quantify the perceived importance of ethical considerations relative to other factors in employment decisions, revealing their comparative lack of prioritization.
2. Characterize the decision-making processes students employ to rationalize applying to companies engaged in activities they deem ethically concerning.
3. Outline the implications of our results for students, educators, and industry.

Background

Computer Science Ethics Education and Critiques

Researchers have long been interested in the effective teaching and assessment of ethics across various academic disciplines (Hedayati-Mehdiabadi, Huang, and Oh 2020). The goal of ethics education in CS, per the ACM/IEEE-CS/AAAI CS2023 curricular guidelines, is to develop students’ understanding how society influences CS, how CS influences society, and their role in this relationship (Kumar et al. 2024). Traditionally, in CS, ethics was taught as a standalone course, yet a growing number of scholars argue that teaching ethics separate from technical material serves to further cement the view that ethics is not an integral component of CS (Fiesler 2018; Grosz et al. 2019). As a result, we have seen an increasing number of technical courses incorporating ethics modules (Brown et al. 2024; Stavrakakis et al. 2021; Jarzemsky, Paup, and Fiesler 2023; Oleson and Taylor 2025), though a large number (38%) of institutions still teach computer ethics as a standalone course (Stavrakakis et al. 2021). Polling European faculty in CS and related disciplines, Stavrakakis et al. (2021) found that 36% of respondents believed their institutions did not teach ‘enough’ ethics as part of the curriculum (and 63% of respondents affirmed that teaching ethics was ‘Very Important’ or ‘Important’).

Surveys of curricula show that instructors teaching ethics use a variety of pedagogical tools (e.g., lectures, classroom discussions, and essay assignments) (Pant et al. 2024; Rivera and Su 2024), with most of the examined syllabi focusing on teaching students how to recognize ethical issues, assess and evaluate these issues, and make reasoned arguments (Fiesler, Garrett, and Beard 2020). To evaluate the effect of these educational efforts on students, most courses rely on proxy measures such as students’ self-reported satisfaction and awareness of ethical dilemmas collected through surveys (Horton et al. 2022, 2023; Skirpan et al. 2018; Brown et al. 2024) or student feedback and writing (Skirpan et al. 2018).

As an example, Horton et al. (2022) created a survey, Ethics Attitudes and Self-Efficacy (EASE), to assess students’ self-reported interest in ethics and technology, as well as their self-reported self-efficacy in dealing with ethical issues. Studying first-year CS students, they found that students improved from their baseline when an ethics module was incorporated in their technical course. In a follow-up study, Horton et al. (2023) compared the effects of embedding one versus multiple ethics modules across multiple semesters and found that: 1) the benefits of the *first* embedded ethics module are robust (i.e. reproducible), but 2) having multiple embedded ethics modules in a semester did not increase self-reported efficacy, and 3) EASE scores dropped between semesters but could be improved, back to the original level, by embedded ethics modules in subse-

quent semesters. Similarly, following the pilot of the Embedded EthiCS program at Harvard, Grosz et al. (2019), measured that, across all the courses, 85% of students agreed with the statement “*The ethics guest lecture increased my interest in learning about the moral issues we discussed*” and “*I would be interested in learning more about ethics in future computer science courses.*”

The above efforts assume that more ethics education will produce practitioners who are more ethically knowledgeable and, consequently, more ethical actors. However, this assumption is not universally shared by educators or students (Widder et al. 2023; Tenbrunsel and Messick 2004; Rivera and Su 2024), as students may feel unsure about how to apply the lessons and discussions to their future work (Rivera and Su 2024), while researchers argue that unethical decision making is not due to a lack of formal education in ethics, but rather to ‘psychological processes’ which enable the unrecognized violation of ethical principles held by the decision makers (Tenbrunsel and Messick 2004). Other work suggests that the lack of ethical decision making is partly due to the process of obtaining industry jobs, internships, and lab placements. When these highly desired positions only value technical prowess, it sends a message to students that critical ethical evaluation is not necessary or beneficial (Darling-Wolf and Patitsas 2024; Kirdani-Ryan, Ko, and Borisova 2024; Sarder and Fiesler 2022).

Evaluating the likelihood that students will use ethics knowledge that was taught to them (i.e., put their education into practice) is difficult. As noted previously, most studies rely on surveying students’ self-reported interest in ethics as a proxy for the likelihood of applying what they’ve learned. Only a few studies have conducted evaluations of, or observed, students applying or demonstrating their ethics knowledge in real-world scenarios (Brown et al. 2024).

Decision-making processes of computer science students and workers

Behavioral ethics is “*the study of systematic and predictable ways in which individuals make ethical decisions and judge the ethical decisions of others when these decisions are at odds with intuition and the benefits of the broader society*” (Bazerman and Gino 2012). Behavioral ethics is interested in the processes and rationalization behind ethical decisions (Folger 2012).

Researchers have described the many ways decision makers make unethical choices while believing they are upholding their moral principles – a process termed ‘ethical fading’ by Tenbrunsel and Messick (Tenbrunsel and Messick 2004). For example, one may use ‘language euphemisms’ to re-interpret their specific context in a way which changes its moral framing or intensity. They also highlight how repeated exposure to an ethical decision may result in ‘psychic numbing’ which, when combined with the natural minimization of moral weight to small changes, can result in many small, repeated unethical decisions being made (termed ‘slippery slope’). Furthermore, ethical assessments may be misinformed, erroneous, or affected by self-interest (Tenbrunsel and Messick 2004).

Focused specifically on computer scientists, Hedayati-Mehdiabadi studied the decision-making processes of CS students enrolled in a computing ethics course at a small Midwestern university in the United States (Hedayati-Mehdiabadi 2022). The students were asked to imagine different hypothetical scenarios (e.g., selecting different privacy levels for an application or delivering potentially buggy software to meet deadlines). Depending on the perceived moral intensity of the decision, there was often a single response favored by the super-majority of students (e.g., selecting the highest privacy setting as default). Various factors affected the rationalization of students such as perceived ethical significance, personal history, and assumptions about the end-user. Hedayati-Mehdiabadi noted that, despite being exposed to various ethical theories, few students referenced (or seemingly applied) these theories in their decision making (Hedayati-Mehdiabadi 2022).

Past research has also demonstrated that the application of ethics by practitioners is not straight-forward. For example, Widder and Nafus (2023) demonstrated how software engineers see the ethical implications of what they build as too far removed from their work (occurring many steps beyond their stage in the “AI supply chain”), thus allowing the modular nature of the AI supply chain to enable ethical distancing. Even if ethical concerns were identified by the engineers in a nearby stage of the “AI supply chain,” the engineers often lacked the power to address these concerns directly (Widder et al. 2023). As Widder et al. (2023) showed, these concerns typically related to the use of the technology under development, where the engineers had limited influence, rather than the design of the technology. Interviewing students enrolled at the University of Colorado Boulder, Sarder and Fiesler (2022) noted further that it was difficult to get students to value ethics due to their perception that employers did not value it.

Methods

Survey

This study was approved by the research ethics boards of Queen’s University, University of Alberta, and University of Pennsylvania and the survey was hosted using Queen’s Qualtrics platform. The full survey can be found in the Appendix. Two nearly identical versions were used, one for Canadian students and one for American students, with only minor adjustments made between them (e.g., aligning with each country’s specific census categories for personal identification). The survey is composed of three sections. The first section deals with demographic information, companies applied to, and ranking a predetermined list of priorities. Individuals responding to our survey (henceforth: respondents) are also able to add a priority not found on the predetermined list. The second section of the survey asks respondents if they have any concerns about their labour being used: 1) for military purposes, 2) by a company engaged in exploitative working conditions (e.g., forced labour or wage theft), 3) to negatively impact the environment, 4) to invade the privacy of others, or 5) to negatively impact the mental health of others – a selection of ethical issues informed by past work

(Widder, West, and Whittaker 2023). The last section of the survey is dynamic, presenting each respondent with different questions by comparing their responses about companies applied to (first section) with their stated levels of concern (second section). If a potential conflict is detected – for example, when a respondent expresses strong concern about their labour being used for military purposes while also indicating an interest in working for companies such as Alphabet or Amazon, which have well-documented military contracts (González 2024) – the respondent was asked to elaborate on their awareness of this tension and their thoughts regarding it.

To mitigate participation bias (also known as non-response bias) (Sedgwick 2014), survey participants were told that the purpose of the survey was to assist CS educators in understanding student preferences and views related to the job search. To avoid order effects bias (Perreault 1975), the questions were structured such that more innocuous questions (e.g., ‘What companies have you applied to?’) were asked before questions more likely to elicit a defensive response (e.g., ‘What are your views of your labour being used for military purposes?’). To minimize framing effects, we iteratively worked to improve the phrasing by beta-testing our survey among colleagues and personal connections several times. More details about the survey methodology can be found in Appendix .

We defined the target demographic as any CS student currently attending a Canadian or American post-secondary institution seeking opportunities post-graduation (e.g., final year undergraduate students), or recent CS graduates who had just completed a job search. We sent emails to university departments and professors teaching 4th year courses. We also posted to university subreddits (where permitted by the subreddit rules/moderators).

Despite our best efforts, our results are subject to various biases common in survey methodology. A potential non-response bias exists, as participants who complete surveys without participatory incentives are often more socially engaged (Porter and Whitcomb 2004). Furthermore, sampling bias from our target population limits the generalizability of our findings. Additionally, while our sample size is in line with past studies (Hedayati-Mehdiabadi, Huang, and Oh 2020; Donaldson 2012; Widder et al. 2023), it is too small to be representative of our target demographic. Lastly, for our subgroup analysis, we combined some categories due to practical sample-size considerations and to enable cross-comparison between American and Canadian respondents. **Subgroup results should be read as suggestive and exploratory rather than as robust, generalizable claims about these groups.**

Qualitative Analysis

To analyze the free-text responses, two authors performed an open qualitative card sort (Zimmermann 2016; Widder et al. 2023, 2019) to assign each response to cohesive categories. Categories (e.g., economic pressure, role/proximity distancing, prestige, etc.) were developed inductively from the responses themselves rather than applied from a pre-existing schema, though annotators were informed by previ-

ous work on behavioral analysis. Two coders independently coded a subset of responses then coded the remaining responses using this shared scheme. Disagreements were negotiated through discussion until consensus and categories were adjusted as required. The resulting analysis was then reviewed by other authors.

Quantitative Analysis

We quantitatively analyze both complete and partial responses – partial responses were included in the analysis only if the respondent completed up to and including the second section (regardless of the completion of the third section). Note, per the REB-approved protocol, respondents were not required to complete all/any questions. As such, there are some missing responses. For transparency, we report ratios and percentages in the analysis, as well as denominators. Full results can be found in the supplemental material.

Our first round of quantitative analysis involves providing descriptive ratios for a subset of comparisons that have large apparent differences (i.e., one proportion or average rank being at least roughly double the other or a large visible difference). Next we evaluate the statistical significance for the comparisons that met this threshold. When comparing the ranked annotations (for the considerations) we used the Mann–Whitney U test (i.e., Wilcoxon rank-sum test) – appropriate for comparing rankings. To compare between concern levels we use Fisher’s exact test – a non-parametric test for binary categorical variables. To reduce the risk of post hoc significance testing (i.e., p-hacking), we do not evaluate statistical significance for any additional comparisons, rather only for those initially identified as having large apparent differences. For these comparisons, we report the corresponding p-values.

Results

All analyses below were conducted using the 129 complete and partial responses. In our analysis, we report ratios and percentages, as well as denominators. Full results can be found in the supplemental material.

Most respondents (70%) were 4th year undergrads or had recently graduated (n=90). All results presented below (e.g., other sub-categories) consider only 4th year undergrads or recently graduated respondents, unless explicitly stated. For respondents in their 4th year or those who recently graduated, we had the following splits¹: Canadian at 61 vs US at 29; Male at 55, non-Male² at 35; White at 40 and Asian³ at 40. We note that all respondents were from accredited schools which taught AI ethics in some capacity (e.g., standalone courses, incorporated modules, etc).

¹For many categories, we do not report counts to maintain the privacy of respondents in line with the approved REB applications.

²We group all other genders under this label together as gender-minoritized/gender-marginalized in CS.

³Small cells are not reported due to privacy concerns as specified in the REB submission.

Respondent Type	All
Remuneration	2.31
Location	3.47
Work Life Balance	3.38
Workplace Culture	4.09
Ethical Concerns	5.01
Prof. Dev. Opps	3.26
Other	6.49

Table 1: Average rank of job considerations for all respondents.

Quantitative Results

For each question, we start by presenting the responses of all 4th year undergrads and recently graduated students, followed by sub-group analyses.

Applying to Industry The majority of respondents (65%) applied to at least one Big Tech company (pre-specified as Alphabet, Amazon, Apple, Meta, Microsoft⁴). Appendix Table 2 shows the full results. We observe no statistical difference in the application rates of US applicants vs Canadians (0.76 vs 0.67, $p < 0.47$) or between Male and non-male applicants (0.73 vs 0.66, $p < 0.49$) in applying to Big Tech. Asian respondents applied at significantly higher rates compared to White respondents (0.82 vs 0.58, $p < 0.01$). Combined, University of Waterloo and University of Toronto (UofT) students applied at significantly higher rates compared to Queen’s University students (0.83 vs 0.40, $p < 0.04$)⁵. We also observed differences between company application rates (e.g., across all respondents, Meta and Apple had fewer applicants) but trends were not consistent.

Job Considerations Table 1 presents the average ranking for all the predetermined considerations: Remuneration, Location, Work-life Balance, Workplace Culture, Ethical Concerns, and Professional Development Opportunities. Across all applicants, we observed that ‘Remuneration’ ranked the highest (with an average rank of 2.31 out of 7) and ‘Ethical Concerns’ ranked last (with an average rank of 5.01). We also observed differences in rankings across sub-groups, Appendix Table 3. For example, Male respondents ranked ‘Location’ significantly lower (3.76 vs 2.97, $p < 0.05$). Respondents from Queen’s ranked ‘Work-life Balance’ much higher than respondents from UofT or Waterloo (2.73 vs 3.81, $p < 0.06$), though the difference was not significant. Respondents also had the option to specify their own considerations. Self-defined considerations included perceived company reputation, ability to leverage position for career progression, and enjoyment/mental stimulation of work.

⁴There is no consensus on which companies should be included when referring to so-called “Big Tech” (Abdalla and Abdalla 2021; Abdalla et al. 2023; Ahmed and Wahed 2020; Widder, West, and Whittaker 2023; Birhane et al. 2022). We chose a restrictive set of companies due to the branching required to make this survey dynamic.

⁵These three schools had the largest number of respondents. UofT and Waterloo are actively recruited from by Big Tech and have a more competitive culture than Queen’s University.

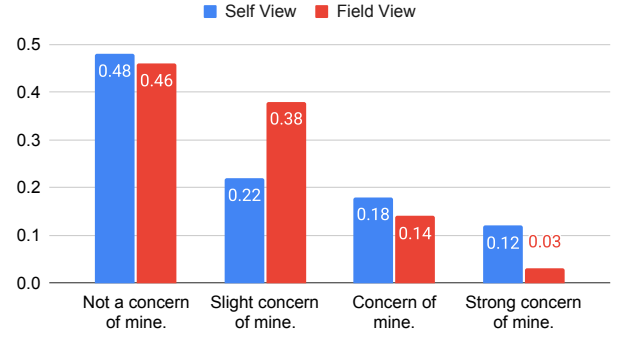


Figure 1: The decimal percentage of respondents who agreed with specific statements regarding the use of their labor for military purposes, categorized by Self-View (individual opinion) and Field View (perceived disciplinary perspective).

Labour for Military Use Figure 1 illustrates the distribution of views held by respondents regarding their labour being used for military purposes (Self View) and what they believed was the view held by their colleagues (Field View). Most respondents (48%) had no concern with their labour being used for military purposes, and this was close to the percent of people who estimated that the field shared the same view. Conversely, while 30% of respondents indicated that use of their labour for military purposes was a concern or a strong concern, respondents estimated that only 17% of the field shared this view $p < 0.04$ indicating that respondents perceive the field caring significantly less than the data suggests.

There is a large variation between gender sub-groups for this concern (as shown in Appendix Table 4). Male respondents were significantly more likely to have no concern regarding their labour being used for military purposes compared to non-Male respondents (0.58 vs 0.30, $p < 0.02$).



Figure 2: The decimal percentage of respondents who agreed with specific statements regarding the use of their labor by a company known to engage in exploitative working conditions, categorized by Self View and Field View.

Labour for a company known to engage in exploitative working conditions Figure 2 illustrates the distribution of views held by respondents regarding their labour being used by a company known to engage in exploitative working conditions. The difference between the perceived lack of concern for this issue by the field (i.e., Field view compared to the respondents' self views) the difference was not statistically significant (0.30 vs 0.17, $p < 0.09$). Likewise, proportion of male respondents with no concern or strongly concerned were not statistically significant (0.20 vs 0.11, $p < 0.35$) and (0.12 vs 0.22, $p < 0.35$) respectively, Appendix Table 5. Likewise there was no statistically significant difference in the number of US or Canadian respondents who reported strong concerns (0.23 vs 0.12, $p < 0.11$).



Figure 3: The decimal percentage of respondents who agreed with specific statements regarding the use of their labour by a company known to negatively impact the environment, categorized by Self View and Field View.

Labour for a company known to be negatively impacting the environment Figure 3 illustrates the distribution of views held by respondents regarding their labour being used by a company that is negatively impacting the environment. The number of respondents with no concern was significantly lower than the proportion expected to have no concern (0.21 vs 0.37, $p < 0.05$). The difference between the proportion of respondents expressing strong concern was not statistically significant (0.09 vs 0.03, $p < 0.31$).

Unlike previous comparisons, we did not observe any significant differences between sub-groups which has large numeric differences such as Canadians being more strongly concerned (0.12 vs 0.04, $p < 0.41$), Appendix Table 6.

Labour for a company known to be violating privacy Figure 4 illustrates the distribution of views held by respondents regarding their labour being used by a company known to be violating the privacy of others, as well the field's perceived view. The proportion of respondents feeling strong concern vs the perceived proportion was statistically significant (0.22 vs 0.01, $p < 0.01$), Appendix Table 7.

Labour for a company known to be impacting the mental health of others Figure 5 illustrates the distribution of views held by respondents regarding their labour being used by a company known to negatively impact the mental health

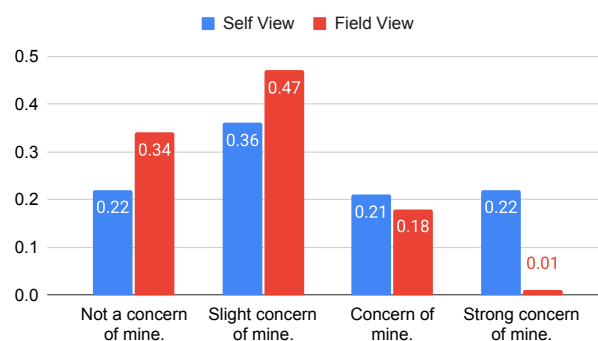


Figure 4: The decimal percentage of respondents who agreed with specific statements regarding the use of their labor by a company known to be invading the privacy of others, categorized by Self View and Field View.

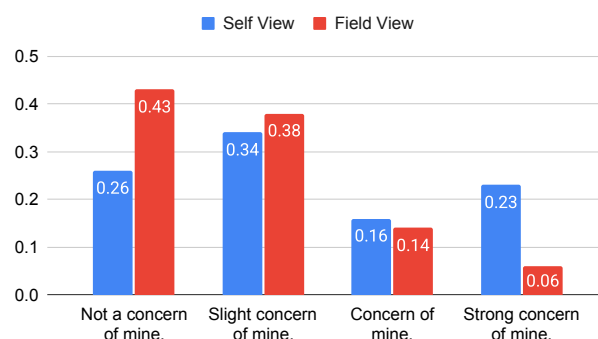


Figure 5: The decimal percentage of respondents who agreed with specific statements regarding the use of their labour by a company known to negatively impact the mental health of others, categorized by Self View and Field View.

of others, as well as what they believe best represented the field's view. In general, respondents felt the field's perceived views on this issue were significantly different from their own. The proportion of responders expressing having no concern was almost half the proportion perceived to have no concern (0.26 vs 0.43, $p < 0.04$). Conversely, the proportion of respondents who expressed strong concern was more than triple the expected proportion (0.23 vs 0.06, $p < 0.01$).

Appendix Table 8 presents the results per sub-groups though we did not find any large differences between the sub-groups.

Awareness of negative impacts For respondents who indicated concerns regarding working for a company known to negatively impact any of the associated concerns, but who had applied to a company with some connection to these negative effects or harmful practices, we presented examples of such behaviour and asked if they were aware of these instances. Awareness of examples varied greatly between respondents and issues with some level of awareness varying between 50% and 83%, Appendix Table 9.

Qualitative Results

Throughout the survey, respondents were prompted to share their thoughts regarding their selections. In this section we present analyses of the responses shared with us with some direct quotes to assess the ethical argumentation provided in justifying decisions.

Justification for selected self views Respondents provided a large variety of explanations of their selected concern levels, some with multiple explanations in a single response. Most explanations were justifications of why their level of concern was not higher (despite neutral framing of the question). The most common responses (18% of respondents) were classified as “moral disengagement” – a process where to reduce feelings of guilt and to maintain a positive moral self-image, individuals disassociate their moral standards from their actions. This can be done in a variety of ways such as moral justification, where individuals re-frame their actions as moral, by displacing their responsibility, or by minimizing harm (Bandura 1990). Minimization of harm was particularly common on issues like privacy (“*I feel protected knowing that they are doing this for millions upon millions of people – what’s the worst they could do to me? I don’t have anything to hide*”). Quotes like this reflect a lack of understanding of the harms of surveillance (Solove 2011).

Economic concerns (and the difficult job market) were a commonly provided explanation. The high level of economic anxiety experienced by Canadian students is reflected in statements like: “*I would be so grateful to have any type of computing science job at all*”, “*Given the state of the current economy with off-shoring and outright replacement of North American workers, I can’t really restrict my scope*”, and “*I [literally] will take internships from Satan if it means I don’t go homeless. [It’s] bad enough for CS grads with job listings plummeting by 35%*”. Such concerns being top of mind is unsurprising given the recent economic downturn, where Canadian youth (aged 15-24) are experiencing a record high unemployment rate of 14.5% (Boissonnault 2024). Canadian tech corporations offshoring jobs previously held by Canadians likely contributes to this sentiment among recent graduates (Palermo 2025; Hokiyo 2023; Harris 2017; Wilson 2025). American respondents reported similar sentiments with one expressing, “*I have had to expand where I apply to, even if I don’t like their practices, in order to increase my chances of receiving a job offer*,” and another stating, “*[anyone would] so long as the pay was good and it was a high-status job*”, reflecting the economic downturn facing the US tech sector (Ito 2024). Given that many students choose to study CS in pursuit of monetary compensation or financial stability (Downey, McGaughey, and Roach 2009), it may be that compensation would have been a major motivation regardless of the status of the economy. Longitudinal analysis of responses is required to confirm this. Several respondents explained that their responses heavily depended on the proximity of their personal work to the particular issue at hand (“*It would depend on the specific project*”).

Other respondents were in complete moral alignment with tech corporations. This viewpoint tended to be more commonly and strongly held among US respondents. Students

stated, “*It would be an honor to serve my country through my work*,” and regarding military applications that it “*would feel patriotic, satisfying, and fulfilling*”. Such views are not surprising given the environment in which many respondents live (e.g., Hollywood movies heavily lionizing the military (Weikle 2020), military flyovers at sporting events (Elbaba 2022), etc.). A subset of the students in moral alignment also demonstrated an interesting view on invasions of privacy: “*Spying on others is a patriotic duty*.” “*I’m happy if they do it to foreigners*,” but “*spying on Americans is not acceptable*.” Some noted that they “*hate companies collecting [their] data*.” The implication of these statements is that the ethicality of the action depends on *who* is directly impacted.

How does this knowledge change your decision to apply to [Company]? If the respondent indicated that knowledge presented to them would change their decision to work for/apply to a company, we asked if they could explain how their decision would change. Only 55% of respondents who indicated some level of concern and had applied to a company partaking in related activities explicitly indicated that they were less likely to apply to roles at the particular companies. A few respondents argued that the moral responsibility lay with third parties such as managers (“*I feel the onus is primarily on [other party]*”) and legislative authorities (“*[I] am hoping that there is legislation introduced to combat it*”).

Students commonly argued that even if they did not apply to the position, another employee would be hired to do the job: “*If I don’t work for them, they’ll hire an Indian for pennies anyways and put out infinitely worse stuff*.” This comment not only refers to the offshoring of jobs as discussed previously, but also highlights the recent controversy surrounding H1B visas in the US. The majority of H1B visa holders come from India and China (Sherman 2025) and many have openly accused the visa scheme of depressing wages and stealing jobs from American workers (Gooding 2025) while tech companies (e.g., Microsoft) claim that the visas are essential to attracting top talent while maintaining the American tech industry’s competitive edge (Sadovi 2025; Fishman 2025). The views on foreign workers ranged from the more run-of-the-mill controversy (as highlighted above) to very strong: “*Every single time someone has ever proposed we bring manufacturing back and stop exploiting the rest of the world through imperialism, they get called fascists or neo-nazis or patriotic idiots ... Isolationism is the most moral and anti-imperialist policy, but it weakens you geopolitically and is unfavorable to most people*.”

What is it about [Company] that makes you feel differently about [Concern]? If it was indicated that the knowledge about company activities would not change their decision, we asked them to explain their reasoning.

Approximately one fifth of respondents indicated that the prestige and salary offered by these corporations trumped their ethical concerns (“*The brand/name recognition of (as well as all the opportunities that come with) these Big Tech companies makes it difficult to not want to seek opportunities there, especially early on in my career*” and “*The benefits of network and growth opportunities outweigh my personal*

contribution [to unethical actions]”). An equal number indicated that while ethics did matter to them, they needed to do more research or were engaging in a more nuanced consideration of what their specific role would be. An equal number of respondents expressed that it was impossible to avoid companies engaging in the concerning action (“*When a company gets large enough, it’s inevitable they’ll end up [partaking in the concern]*”) or used other moral argumentation to justify their choice.

Responses varied according to specific areas of concern. Those who were concerned about military use of their labour explained that their comfort at working for said companies greatly depended on what specifically their team was working on (e.g., “*If either directly developed arms I would feel differently*”). For those concerned about companies using exploitative working conditions, many felt that it was impossible to find work if they excluded companies engaged in exploitative practices. These responses differ from the responses provided by respondents concerned with privacy, many of whom indicated that the prestige, salary, and career opportunities matter more than the ethical concerns (e.g., “*The pay and benefits are miles ahead of non-FAANG companies. Also, just having the name [company] significantly increases the strength of a resume.*”). Likewise, these responses also differed from the responses of those concerned about mental health who argued that the fundamental moral responsibility fell upon the users, law-makers, or society (e.g., “*People need more self control*” and “*This is more about individual control [than corporate responsibility]*”).

What would it take to make you reconsider working for [Company]? If the respondent indicated that they were unsure if they would act on the knowledge presented to them about company activities, we asked them to describe what it would take for them to reconsider working for said companies.

Many respondents indicated that it depended on the specifics of role (e.g., “*providing [...] cloud services to the military would not be sufficient to stop me from applying, but it would be a factor in accepting a role and I would keep it in mind ...*”) and situation (e.g., “*The extent to which [Company] goes to lobby against climate change could change my views*”). These responses demonstrate that students believe that the actions may be unethical in theory but are willing to overlook them in practice, under specific circumstances. The responses also speak to the alienation of workers from their labour (So et al. 2025). On the other hand, some respondents indicated that money/prestige/career were too important (“*More money (and to an extent, prestige) means further compromised morals. Unfortunately*”), possibly reflecting the prestige bias observed in hiring practices (Chua and Mazmanian 2020; Biehl et al. 2025). This bias reinforces students’ beliefs that to get ahead in what they perceive as difficult economic times, they have no choice but to compromise their ethical principles (Chua and Mazmanian 2020).

There were some demographic differences in the types of responses provided. Canadian respondents were much more likely to justify their choices by expressing desperation for a job (“*I desperately [need] some sort of experience before I*

graduate,”). US respondents were much more likely to indicate that the remuneration/career progression mattered more (i.e., less economic desperation) as reflected by: (“*my application to [Company] is contingent on how much they are willing to buy my morals from me*”) or engage in moral disengagement and defeatism with regards to the matters which concerned them (“*Honestly, it’s too easy to find out that a company is not reducing their climate impact [...] Feels like it’s impossible to individually make a positive climate impact when businesses are unable to be held accountable*”).

Discussion

Apathy

Many of the respondents were seemingly unconcerned with any of the listed issues. One possible reason for lack of concern is that the students surveyed tend to be insulated from the effects of the issues raised (compared to factory workers or those in the global south). The majority of the ethical issues examined do not directly impact Canada or the US (i.e., the first-order effects of militarism, exploitation of labour, climate change are likely not to initially occur in Canada and US to the same degree as other countries). In addition to geographic distance, demographic shields (those pursuing STEM degrees tend to have higher economic status (Thomas and Lonobile 2021)) further protect them from the down-stream impacts of their work.

Furthermore, the observed lack of concern across issues may also reflect differences in value alignment between respondents and the survey framing. The set of issues considered, while leveraged from past work, implicitly assumes that these topics represent salient ethical concerns in computing practice. Respondents may prioritize different ethical considerations that we did not capture: **low levels of concern does not necessarily indicate indifference to ethical questions, but may instead reflect a misalignment between the survey’s framing and students’ ethical priorities.** In the appendix we discuss alignment between the concerns discussed in the survey and those expressed by respondents.

The free-text responses largely reflect dynamics previously observed in ethics education as studied by Abdurrahman et al. (2023), namely how bids for ideological expansion (such as asking students to reflect on their decision to engage with unethical entities) can be rejected in a myriad of ways: to deflect and dismiss, affirm and move on, to reframe the conversation and most commonly seen in this study, to defer responsibility.

Ethics education is, of course, not to blame for apathy nor is it the only lever available to tackle this apathy; structural constraints shape what any individual intervention can realistically achieve. Job-seeking students perceive entry-level opportunities outside of ethically contentious companies as limited, and face financial pressures which meaningfully narrow their possible choices. Complementary interventions worth exploring include (but are not limited to): collective organizing efforts among tech workers (Sum et al. 2025), and institutional support for students seeking roles in public interest technology, nonprofits, or government (akin to how loans for law graduates are forgiven for service to public

institutions (Smith 2023)). While ethics education remains important to enabling student to act on their moral principles, its impact is likely to be greatest when students have real alternatives to choose from.

Taking a broader context, we note that most social activism (at the student and faculty level) has historically not come from those in STEM. For example, when professors at the University of Michigan were organizing a ‘work moratorium’ in protest of the war in Vietnam, the majority of signatories were professors in the social sciences and humanities, “most without the security of tenure” (Tobin 2023). This has also been re-observed with recent pro-Palestine encampments, where most signatories of letters of support appear to be from the humanities (e.g., see Brown University Faculty Members (2023)), and most tenure denials stemming from (support for) activism appear to affect the humanities more (Scott 2026). Thus, apathy may be more indicative of a field-wide aversion to social causes.

Effects of Curriculum on Student Concerns

Universities typically position themselves not only as providers of technical training but as institutions that develop graduates into thoughtful, ethical contributors to society; a goal reflected in the mission statements of many CS programs as well as curricular guidelines (Kumar et al. 2024). From this perspective, if students graduate without developing the ability to act upon and reason through the ethical dimensions of their professional lives, that represents a shortcoming of their education.

Prior work found required ethics courses in only 33% of surveyed universities (Weichert et al. 2025). This was not the case with our sample. Examining the degree requirements of institutions from which we received multiple responses (covering approximately 83% of respondents) showed that 56% had a required standalone ethics course, while the remainder (except for a single non-ABET accredited institution) incorporated ethical education content through mandatory course modules. Thus, ethics instruction, in some form, was present virtually across the board.

While ethics instruction is not solely responsible for students’ ethical reasoning, we found that the variation across our sample in how concerned students are about the different ethical issues (Appendix Figure 6) corresponds with what we know about the topics covered on typical CS ethics syllabi (though syllabi do not necessarily capture everything covered in a course). Fiesler, Garrett, and Beard (2020) found that none of the syllabi they examined addressed military applications of technology, while just over half discussed privacy and surveillance. This coverage in syllabi could partially explain why concerns about labor used for military purposes ranked among the lowest of all issues here – a finding that, at first glance, appears to contradict prior work suggesting that military applications of one’s labor are at least as prominent a concern as privacy, surveillance, or inequality, in a study of the ethical concerns of (already employed) software engineers (Widder et al. 2023).

We looked at CS ethics syllabi from institutions with the six largest respondent groups (covering 60% of respondents). These addressed both micro-ethics (professional

conduct and standards) and macro-ethics (broader societal responsibility), and several used past industry scandals as case studies, or discussed how regulatory environments shape company behavior. Notably, only one syllabus explicitly framed ethical discussion in terms that positioned students as moral agents with responsibilities as future workers – giving them a personal stake in the choices they will face professionally.

We agree with prior work (Sarder and Fiesler 2022; Raji, Scheuerman, and Amironesei 2021; Brown et al. 2024; Thompson, Dombrowski, and Smith 2025) that explicitly preparing students to navigate ethical decisions in their working lives – including decisions about where to work – is a direction worth taking more seriously in CS ethics courses, as overall curricula do not appear to impart this skill-set. Re-thinking tools, modes of thinking, and courses to support moral agency, and whether doing so shifts student behavior, is a question we hope future work will take up.

Perceived Gaps in Ethical Engagement

While there was a large sense of apathy, we observed that, for all issues except exploitative working conditions, there was an over-estimation of the sense of apathy of the field as a whole. For those most concerned about their labour being used for military purposes, there was a severe underestimation in the level of strong concern among others.

This large gap between respondents’ self views and their perceived view of their field could have several explanations. One possible explanation is that the ethical questions raised may be viewed as political, and in STEM fields political advocacy can be seen as violating professional norms (Tormos-Aponte et al. 2023). As such, students who have such concerns may feel uncomfortable expressing them publicly lest they risk their future careers: a student who assisted in this work requested not to be acknowledged fearing that working on a paper analyzing the intersection of the workplace, personal ethics and wider politics would compromise their chance at a successful career – another manifestation of the desperation for employment felt by respondents.

Another possible explanation for the overestimation of apathy among fellow computer scientists could be a lack of observable actions aligned with ethical principles. If their peers, like most respondents, rationalize personal compromises, it may be difficult for individuals to recognize that others share their ethical concerns when those concerns are not acted upon. Furthermore, students and workers do not see ethical behaviour rewarded in CS (be it recognition from peers, honours from institutions, or material gains), thus placing ethical behaviour outside the norm of the ideal CS person (Darling-Wolf and Patitsas 2024). In fact, the persecution of ethical actors (e.g., whistle-blowers or protesters) may actually deter workers from reflecting too long on the implications of their day-to-day work. Schiff et al. (2021) echo similar findings, noting that students feel a growing disconnect between their careers and their ethical tendencies: “Several interviewees also seemed to expect or hope that their social responsibility activities would fall into place eventually. . . academic success and career growth appear to be the clear priorities”.

Sub-group Differences

Our survey highlighted some differences between respondents based on self-identified groups. Due to sample size issues, statistical testing for sub-group differences based on specific ethical issues were not robust. Corresponding percentages and p-values should be interpreted as exploratory signals rather than as confirmed, generalizable effects – larger sample sizes are needed to confirm (or deny) the existence of any trends. For ethnicity, we limited our analysis to White and Asian due to sample size issues. While there was little difference between the groups on overall prioritization of concerns, for some responses, e.g., rate of application to Big Tech, the differences were significant. These differences could be caused by a wide variety of socio-cultural factors (e.g., immigration status/time, societal expectations, etc). Such a comparison is sensitive and must be done carefully to avoid falling prey to stereotypes⁶. The intention of this analysis was to highlight that there are possible differences among groups that may help inform curriculum development efforts, not to make generalizable claims about entire groups of people.

There were also differences observed between Male and non-Male respondents. Non-Male respondents valued location and ethical concerns more and were less likely to state having no concern for the ethical issues surveyed (which held true for all except mental health). These differences, some of which are statistically significant, are in line with recent work highlighting the growing political differences between young men and women (Burn-Murdoch 2024).

We also observed some significant differences between schools (e.g., rate of application to Big Tech). Concerns regarding the use of labour varied between schools and were highly dependent on the specific issue. These differences could have various explanations. For example, co-op programs at the Universities of Waterloo and Toronto may create a social pressure to pursue prestigious positions (i.e., “Cali or Bust”) and could affect the way corporations interact with the schools (e.g., active recruitment and partnership). It may also be that the surrounding community, campus culture, and job market could affect student behaviour (e.g., living in a large city may result in a positive outlook on future opportunities compared to living in locales with limited local employment opportunities).

We observed the most pronounced differences between U.S. and Canadian respondents in the qualitative analysis. Specifically, Canadians were more likely to frame economic concerns in terms of financial insecurity, while American respondents more often highlighted the importance of financial reward (i.e., remuneration). Very strong descriptive support for the military was also more frequently expressed by American respondents.

Implications of Our Work

Our survey reveals that while students have high levels of awareness regarding the possible ethical and societal issues

⁶Such as the controversy which arose after a talk at NeurIPS framed Asian students as being less ethical/less likely to be taught ethics (Ha 2024).

they may encounter in their employment post-graduation, this awareness does not necessarily translate into effective ethical decision making, echoing similar findings in previous work (Sarder and Fiesler 2022; Raji, Scheuerman, and Amironesei 2021). Students appear to struggle to apply or prioritize this knowledge in their own personal contexts; our findings indicate a heavy reliance on moral disengagement. This disconnect between awareness and ability to act underscores the importance of equipping them with tools to critically evaluate situations, recognize flawed reasoning, and confidently apply their understanding in practice. We believe that educators could help their students by presenting them more realistic ethical conundrums (such as those faced during the job search) earlier in their education, allowing them to consider possible (and more ethically consistent) responses before encountering them in real life.

For corporations: while many students appear unconcerned with the issues presented in this work, it is clear that most of those with concerns are still going to apply to companies whose actions they disagree with, despite their reservations. Given that it is unlikely companies will be able to determine which applicants feel this way (as they will likely not self-identify), this presents a risk to corporations who may unknowingly face ethical conflicts with a sizable portion of their workforce. It is also worth noting that respondents regularly underestimated the percentage of their peers who shared their ethical concerns, which could have implications for those organizing worker resistance actions.

Future Work Formalized adoption and expansion of this survey would increase the robustness of our results and enable more indepth analysis as well as longitudinal analysis.

Conclusion

In this work, we explored the decision-making processes of current or recently-graduated job-seeking CS students studying in Canada and the US with respect to various ethical issues. We found that ethical concerns ranked last among all of the possible considerations students could select, while remuneration ranked highest. Most students had applied to at least one of the Big Tech companies. The justifications provided for the decisions made during their job searches highlight a possible gap between ethics education and students’ ability (or willingness) to apply the lessons to the decisions they face in their working lives. Respondents were very sensitive to external economic pressures, with some even viewing the search for employment with desperation, which resulted in moral compromises. Those compromises were often justified using a common set of rationalization strategies. These findings have important implications for educators, who should consider changes to curriculum to directly address the moral dilemmas that are being faced by new graduates and their tendency to rationalize their decisions. The findings also have implications for activists who could gain a better understanding of the outlook of new employees, and for corporations investing in their future workforce. We hope that this work will serve as a pilot study for a larger survey conducted by a professional or scholarly organization with the influence to reach a wider sample of respondents.

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