Chapter 5
Standing Alone in Computer Science Education:
A Story of Black Women in Academia

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ABSTRACT
This chapter explores issues that have influenced Black women in Canada and the Caribbean in their pursuit of advanced degrees and regular academic roles in Computer Science (CS) and related fields. The concern is with the low representation of Black women in such roles and the reasons why some women have chosen the field and others have fled from it. The issues are related to gender and race and have been gathered from the scientific literature on Computer Science Education. Black women in Canada and the Caribbean who are on paths towards and in regular academic roles in CS were surveyed about how these issues have influenced them and their peers for or against CS in general and more specifically advanced education in Computer Science, since these such choices for CS are a requirement for regular academic roles in CS. This work delivers insights into an understudied locale for an underrepresented group in a field critical to economic development in Canada and the Caribbean. Based on our findings, we make recommendations to increase the number of this underrepresented group.

INTRODUCTION
An experience is told of a faculty member who visited the library of the Canadian university where she worked, selected her research literature, and proceeded to the desk to borrow them. On presenting her identification card, the only requirement for faculty, she was pressed to provide a letter from her Department Chair to validate her credentials. Though an incident of singular bias in her environment, she was anomalously, a Black female university professor on regular academic (RA) staff in Computer Science (CS) in Canada. One may expect that the demographics of the Caribbean provide a strong population from which Black, female, RA staff may emerge, however, Caribbean female university professors in CS are also few. This library experience is a notably disconcerting example underlining the lack of black women on RA staff in CS.

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The rarity of women and minorities as distinct groups in CS is well documented in North America (Trauth, Quesenberry, & Yeo, 2008). The underrepresentation is discussed in the 2013 Taulbee Survey (Zweben & Bizot, 2014) done by the Computing Research Association (CRA), which is an association of over 200 North American academic, governmental and industrial departments in Computer Science, Computer Engineering, and related fields. Further, Taulbee reveals that black computer scientists graduating with PhDs are only 1.5% of all CS PhDs in the United States (US) and Canada. Black female Computer Scientists with Doctoral degrees make up 3% of all females graduating with PhDs in CS (Zweben & Bizot, 2014). The void may be expected in a country where blacks make up less than 3% of the population (Statistics Canada, 2012); however, in the Caribbean where the demographics place blacks at over 80% of the population (Caribbean Community (CARICOM) Secretariat, 2011), black females (and females in general) also number few amongst PhD graduates. Though no official statistics linking gender and race to the graduates was available for the Caribbean, there is anecdotal record by administrative and academic staff that there have been at most two female PhD graduates, from the University of the West Indies at Cave Hill and at St. Augustine within the history of the CS programs at these universities.

**The Research Problem**

With such a low level of black female PhD graduates in Canada and the Caribbean, we formulated the following research question:

*What are the issues that influence some Black women in Canada and the Caribbean to pursue regular academic roles in Computer Science and their peers to choose other paths?*

It is desirable to have consistent representation of Black women in academic staff in order to build research capacity with a diversity of experiences in approaches to innovation in society (Rheingans, Brodsky, Scheibler, & Spence, 2011).

Canes also states that female role models are helpful in the support of women towards success in a given field (Canes & Rosen, 1995). This means that there must be long-term contact with Black female faculty members so that students can see them as representations of success, stability and possibility for themselves. Such faculty members must represent a history of active and successful practice in the area of CS through previous employment, ongoing research and consulting based on expertise, as well as the ability to understand the material and succeed in delivering it through strong teaching.

Approximately 20% of RA staff at Caribbean universities above are black women; but the percentages are still low compared to the overall population of black females in Caribbean countries (50%). In Canadian schools, Black women constitute at most 1.3% of all PhD graduates in CS (Zweben, 2014; Zweben & Bizot, 2014). In the course of our research only two Black women could be identified as members of CS RA staff at Canadian universities.

The numbers for Canada are based on estimates calculated as a product of the percentage of females graduated and the percentage of blacks graduated in the programs indicated. There are no direct data for black females. Tracking this information is a problem even in the US where more detailed data are kept. For example, in the study completed by the National Science Foundation (National Center for Science and Engineering Statistics, 2013), black females graduating with PhDs are unspecified. That group is reported with underrepresented minorities, who are earning CS doctorates at a rate that has plateaued
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