Computer Science Scholarship Guidelines
Whitman College
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The scope of the field

Scholarship in computer science (CS) employs a range of theoretical and empirical approaches to study computational problems, processes, artifacts, and systems. The field has long addressed problems arising from practical applications of computing and from the sciences. As computing becomes more pervasive through all aspects of life, further opportunities arise for collaboration with social scientists and humanists in the development of new tools for quantitative analysis and creative expression. Pollack and Snir write for the Computing Research Association (CRA): "While 'core' areas of computation—such as operating systems, programming languages, networking, and so on—will continue to produce key advances, there is an emergent agreement among computer and information scientists that close interactions with other disciplines are essential to the health and advancement of our field" [6].

At Whitman, we affirm the value of both core CS and interdisciplinary CS research. We appreciate diverse approaches to computer science research and understand that a coherent research agenda may address a complex problem using multiple approaches or may apply one approach to a suite of related problems.

Criteria for evaluation

In evaluating candidates for tenure and promotion, the Faculty Code (Chapter 1, Article IV, Section 4), emphasizes "evidence of the candidate's engagement in the intellectual life of his/her field of study beyond the boundaries of the campus community." First and necessary is "Research and writing that appear in peer-reviewed publications…or other peer-reviewed professional activities in the candidate's field(s) of study."

We affirm that peer-reviewed publications are necessary to achieve promotion and tenure in computer science. With the CRA, we emphasize quality over quantity of publications [3]. At the time of tenure, faculty should have publications of substance and a coherent research agenda. For promotion to full professor, faculty should show evidence of an ongoing successful program of professional development, though the focus, forms, and rate of such activity may change over time.

We value but do not require peer-reviewed publication in related areas of study. Beyond matters of pedagogy and curriculum, as suggested by the Faculty Code, work in related areas may address the state of the profession, ethical problems, organizational policies, advice to junior colleagues, and so on.

In computer science as in other fields, students clearly benefit from participation in faculty research. Some research problems in computer science present opportunities for contributions by undergraduate students. Other problems do not, because they require too great a depth of knowledge, experience, or engagement. Therefore, we highly value but do not require faculty collaborations with students.

Forms of publication

In computer science, conference proceedings and journals are the most common venues for peer-reviewed, archival publication. The Association for Computing Machinery (ACM) provides the following definition:

> The term "archival" is used to refer to publications that present a form of work expected to stand the test of time, and specifically a form of work reviewed according to criteria intended to assess its correctness. [1]

The ACM counts among its archival publications not only journals, but also designated magazines, newsletters, and conference proceedings [1].

Conference proceedings and journals are comparable in their peer-review processes and selectivity [5]. In a national survey of experimental computer scientists, many "preferred conferences as the means of

dissemination by which to achieve maximum intellectual impact" [4, p. 62]. Indeed, a conference paper may have impact comparable to or even greater than the impact of a subsequent journal article [2, Appendix A].

Conference proceedings are often preferred for their faster review cycle and shorter time-to-print, as well as the opportunity to present and discuss the work at the conference [4]. At the same time, conference articles are limited in length and often expected to focus on a single contribution. Journal articles are preferred when they provide opportunities to present the work in greater depth or to synthesize a larger body of work. Preference for conference or journal articles also varies among subfields [5].

Computer science conferences typically provide opportunities to participate beyond the presentation of peer-reviewed, archival research papers. Such opportunities take a variety of formats: posters, lightning talks, demonstrations, panels, tutorials, "birds-of-a-feather" discussions, and so on. These venues are usually refereed through a competitive proposal process, though typically less competitive than the peer review process for full papers. Acceptance rates for such venues might be around 50%, versus 35% or lower for archival paper tracks at competitive conferences. Often, the proposal or an abstract is included in the proceedings; these publications are typically considered "non-archival" in that they do not constitute a canonical publication of the work (though they may be cited nonetheless) and do not preclude later publication as part of a full article. Such activities are valued but neither necessary nor sufficient for promotion and tenure. When they address the candidate's field(s) of study, such activities provide evidence of progress on a scholarly agenda prior to peer-reviewed publication [3]. We especially value such activities when undergraduate collaborators are the primary authors or presenters of the work. Candidates should clarify their roles as authors of such works.

Meetings described as "workshops" vary dramatically. Some workshops are highly competitive conferences with peer-reviewed, archival proceedings. Other workshops are collaborative work sessions. When such workshops require written contributions, they are typically subject to a lesser standard of peer review, and may or may not be published. Authors of workshop papers should clarify the nature of the venues.

Computer scientists are typically not expected to publish books. However, the publication of a textbook or monograph obviously requires a sustained intellectual effort. Book chapters, like journal articles, provide opportunities for explication and synthesis. Because peer review of books varies significantly from publisher to publisher, authors of books and book chapters should clarify the nature of their review.

The ACM, the IEEE Computer Society, and other organizations publish magazines intended for broad audiences including students, scholars, and practitioners. Because of their reach and accessibility, magazine articles can have exceptionally high impact. At the same time, peer review of magazine articles can vary dramatically, even within a single publication. Therefore, authors of magazine articles should clarify the nature of their review.

In computer science as in other scientific disciplines, most publications are co-authored. Unfortunately, there is not a single convention for the ordering of authors. Common conventions include the first author as primary contributor, students before faculty, alphabetical order, and combinations of these. The candidate should clarify the nature of their contributions.

For candidates with interdisciplinary scholarship, we value work published in venues of the cognate discipline(s) equally with work published in computer science venues. Such publications shall be considered "peer-reviewed publications…in the candidate's field(s) of study" as long as the candidate's contributions draw upon their computer science expertise and the publication has a suitable peer review process. The candidate should clarify the nature of their contributions and the type of peer review.

Other forms of peer-reviewed professional activity

Grant proposals: We value but do not require proposals for external research funding. Grant writing is a time-consuming process requiring similar skills, expertise, and insight to publication in the field. Funding agencies such as the National Science Foundation (NSF) subject proposals to a stringent process of peer review. Funding is limited and highly competitive. If a candidate submits a proposal to a rigorous, competitive funding agency such as the National Science Foundation and receives positive reviews on the proposal, we

view this as an accomplishment comparable but not equivalent to peer-reviewed publication regardless of whether the proposal is funded.

However, not all funding sources are as competitive or rigorous as the NSF. Candidates who receive external grants, or who include unfunded proposals among their peer-reviewed work, should provide context regarding the competitiveness of the grant program and the nature of peer review.

Software and other artifacts: Experimental computer science often involves the creation and evaluation of computational artifacts. Such artifacts are most often software, but may also take form as hardware prototypes, specifications, test suites, performance benchmarks, etc. Such artifacts express the scholar's ideas and permit the examination of those ideas in ways that a publication cannot [5]. Moreover, contributions of tools, components, and platforms for others' use can have significant impact within the discipline or beyond.

To thoroughly assess the impact of experimental research, the CRA recommends that external evaluators are familiar with software or other artifacts resulting from the research, in addition to the peer-reviewed publications that report on those artifacts or the results of their use [5]. To facilitate evaluation of software, and to enhance its potential for impact, we recommend publication of source code alongside executable files.

Peer-reviewed artifacts are highly valued, but are neither necessary nor sufficient for tenure and promotion. Indeed, there is no discipline-wide standard for peer-review of software and other artifacts. If an artifact is published in a form that is subject to peer review, the candidate should explain the nature of that review. Metrics such as number of downloads or citations may be used as indicators of an artifact's impact.

Non-peer-reviewed publications and other professional activities

We value but do not require professional activities that take forms other than peer-reviewed publication, such as technical reports, invited talks and publications, popular media appearances, professional consulting or contract work, blogs on professional or scholarly matters, and course materials shared on the public Web. When a candidate deems such contributions significant, they should provide a narrative and/or metrics providing evidence of the work's impact.

We also value service to the peer-reviewed publication process: editing a book or journal; chairing or serving on a conference program committee; reviewing works such as journal articles, conference papers, grant proposals, book proposals, and so on. Publishing book reviews, letters to the editor, and technical perspectives may also be considered an extension of this process. Being invited to review and respond to others' work confirms the achievement of a scholarly reputation.

Active involvement in professional organizations

Involvement in professional organizations may include holding elected office, serving on a committee, sponsoring or organizing a meeting, nominating others for recognition, reviewing such nominations, and so on. Since the time commitment and value assigned to such activities can vary, a candidate should clarify what the duties entail and check with colleagues before committing to significant responsibilities.

Some professional organizations publish documents such as reports, recommendations, and technical standards. Examples include the CRA best practices memos cited throughout this document (http://cra.org/resources/best-practice-memos/), curricular guidelines jointly published by the ACM and the IEEE Computer Society (http://www.acm.org/acm-ieeecs-coop/curricula), reports of the ACM committees on public policy (http://www.acm.org/public-policy), and "Requests for Comments" (RFCs) published by the Internet Engineering Task Force (IETF) (https://www.rfc-editor.org).

Being invited to author such a document confirms one's reputation in the field. Preparing such documents can involve a significant investment of scholarly effort and expertise. Documents may be subject to extensive discussion and revision within the organization, constituting a form of non-blinded peer review. This is particularly true of documents that prescribe standards or policies. Therefore, such documents may be considered as a supplemental form of peer-reviewed, archival publication, within or beyond "the candidate's field(s) of study." A candidate who has authored such a document should clarify the significance of the document, the nature of its review, and the extent of their contribution.

References

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[3] Friedman, B. and Schneider, F. B. 2015. Incentivizing quality and impact: Evaluating scholarship in hiring, tenure, and promotion. Approved by the Computing Research Association Board of Directors, February 2015. Retrieved December 16, 2015 from http://cra.org/resources/best-practice-memos/incentivizing-quality-and-impact-evaluating-scholarship-in-hiring-tenure-and-promotion/

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[6] Pollack, M.E. and Snir, M. 2008. Promotion and tenure of interdisciplinary faculty. Approved by the Computing Research Association Board of Directors, July 2008. Retrieved December 16, 2015 from http://cra.org/resources/best-practice-memos/promotion-and-tenure-of-interdisciplinary-faculty/