

Project One

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The study of computer science (CS) has continued to accelerate in growth since its early roots in the notebooks of Charles Babbage, the halls of Bletchly Park, and the practical pioneering of Grace Hopper. It is thanks to computers and computer science that so many basic conveniences are available in the modern world, and it is nearly impossible to find a discipline that has not been positively influenced by computers in one way or another. Despite making up only 8.1% of degree recipients in 2012(“Table 318.20” 2015), the field of computer science has made an indelible mark on almost every other field imaginable. Across so many disparate applications of computer science, developers need a method of communication that allows for growth of the field that binds them. Thankfully, the proliferation of home computers and the internet has only strengthened the bond that the computer science community shares today. Many tools of communication exist already, and more are being produced every day. One tool can spawn a multiplicity of communities, each wholly distinct from the next. Another tool can be used as more of a soapbox where declarations of principle and value are archived for public viewing. Targeted discussion is the ultimate goal, and many communities require strict moderation to ensure that a culture of positive discourse can be achieved. Academic Journals serve as a repository of growth made in pushing the boundaries of the computer science field, and each journal can provide reliably well-tested knowledge. Growth in the field of computer science can be demonstrated by the level of communication and discourse which its members have the ability to cultivate. The field of computer science relies primarily on

internet communities and journal articles to maintain a high level of growth in a culture of interdisciplinarity.

With the immense variety of communication tools, an aspiring member of discourse must have the wherewithal to probe for and discover new communities. More often than not, communities reference one another and support a sort of cross pollination between groups through the sharing of knowledge, ideas, and users. Where some communities encourage the public display of personal information among a real-world friend group, others encourage pseudonymity or even total anonymity. The type of content that can be shared on one tool can fundamentally affect the type of community that arises. Social news sites are built to facilitate the connection of users to the panoply of nodes that comprise the internet. The content of a social news site is simply a stream of links submitted by the site's users. Each user can rate a link positively or negatively as well as add to the conversation with commenting abilities. *Hacker News* ("Hacker News" 2015), one of the most potent examples of social news, proves itself to be valuable to computer science professionals of many kinds. Run by the startup incubator Y Combinator ("Y Combinator" 2015) *Hacker News* (HN) boasts a vibrant society of startup founders, engineers, students, and computing enthusiasts. Content submitted for public approval is evaluated, and the power to collectively support or reject content allows users to play a role in the curation of content which represents the interests of the group as a whole. This democratization of sharing allows the most relevant and useful information to rise while noisy or frivolous information languishes; however, this user-driven moderation is not foolproof. In any human society, a major threat will always be social manipulation, and online societies are no different. When the only preview a HN user can see is a short one line description, the submitter must decide how exactly to advertise the content being promoted. Content on HN generally takes on an entrepreneurial tone, and in many cases, submissions are simply product advertisements. Alternately, other submissions are of a more educational or collaborative nature. Links to open source projects, tutorials, and, in some cases, academic journals. Ranking in the top 15 posts of all times ("Hacker News Top Links" 2015), the post *The Heartbleed Bug* outlines the cause and effect of a

severe security vulnerability that affected (and continues to affect) computers around the world (“HeartBleed Bug” 2015). Though not written in a scholarly style, it reads very much like an academic article. It begins with an overview, defines some basic terminology, describes the main problem, and provides a solution along with plans for future action; additionally, a list of references proceeds the main text. While scholarly articles are not the most frequently posted texts, a great deal of value is given to content that contributes to the CS community as a whole; as a result, texts that doesn’t follow any strict academic guidelines can stand on equal footing as their scholarly forebears.

Where online forums and communities are valuable because of their informality, the rules and regulations in publishing a journal article lead to a stronger and more consistent literary experience. While contribution to discourse online is, relatively, effortless, the barrage of rules, guidelines, and peer reviews prevent all but the most motivated computer science students and academics from article submission. PHD student Andrew Crotty, himself a coder and reader of academic journals likened a good article to a, “compelling story”, that avoids, “trying to cover too many unrelated topics or ideas.” (Crotty 2015) As a well written novel might have a central theme and follow a narrative structure, so too are journal articles more intriguing when the focus on subject matter is tight and the writing has a formal structure. This structure, which can be seen in most articles, boils down to, “(1) abstract, (2) introduction and motivation, (3) overview of the work, (4) detailed description of methods, (5) experimental results and discussion, (6) related work, (7) conclusion, (8) citations, and (9) appendices,” (Galakatos 2015). Though some of these sections can be reordered, this base structure provides a progression of logic that the reader can more easily follow. Alex Galakatos, another CS professional, described how important it is to, “convince readers in the beginning that your work is important and worth reading, otherwise they will quickly become disinterested and stop reading,” (Galakatos 2015). Style, structure, and logical progression are all hallmarks of an impactful and literate piece of writing. The high amount of effort required to produce an accepted journal article ensures that the level of quality and thought put into the subject matter is worthy of pursuit by a potential reader.

Closer inspection of the submission guidelines in major academic journals can provide insight into the hurdles that must be jumped in the process of getting an article published. The journal *ACM Transactions on Software Engineering and Methodology* seeks to publish, “papers on all aspects of designing and building large, complex software systems: specification, design, development and maintenance,” (“ACM Transactions on Software Engineering and Methodology” 2015) and has tackled this wide range of subject matter since 1992. One sample article from this journal, “Automatic Workarounds: Exploiting the Intrinsic Redundancy of Web Applications”, elaborates on a method of creating web applications that are robust and sturdy through the utilization of principles inherent to the domain of web development. This ACM journal can take a relatively broad scope of subject matter and deliver it to its audience. Journals can also be incredibly nuanced and tailored to a specific application of computer science, one such example being the MIT Press *Computer Music Journal*. Founded in 1977, the *Computer Music Journal* prides itself on being an, “essential resource for musicians, composers, scientists, engineers, computer enthusiasts and anyone exploring the wonders of computer-generated sound,” (“Computer Music Journal” 2015). This tight focus on electro-musical subject matter allows the Computer Music Journal to provide robust and fascinating developments in a subset of computer science that may not often be popular. One article entitled “Buttons, Handles, and Keys: Advances in Continuous-Control Keyboard Instruments” describes an augmentation to digital keyboards where a touch sensitive overlay is placed over each key, allowing for controls over any arbitrary parameter, for instance pitch bend, volume, or resonance (McPherson 2015). In this article, the author provides historical context, implementation details, and additional applications of this technology, each a hallmark of academic papers. In order to submit this paper to the MIT Press for evaluation, the author had to follow a strict set of guidelines not limited to a 45 page style and spelling guide, Chicago citation styling, and anonymous submission (“Computer Music Journal Submission Guidelines” 2015). Whether promoting the application of CS to the professional world or to another discipline, journals provide a large body of knowledge to the community, academic or otherwise.

Interdisciplinarity, or, the ability to transcend the rigid boundaries of academic disciplines, is a fundamental application of computer science. Beginning its life as a subset of mathematics, CS itself became an interdiscipline and over time became, “like a discipline, developing its own curriculum, journals, professional associations, and . . . perspective” (Repko). When one field of study can so drastically alter the way other fields are approached, there is no one concrete distillation of information that centrally relates to its academic community. Electronic musicians, entrepreneurs, and PHD students all have the capacity to build the CS field as a whole, and while a contribution might take the form of a scholarly article or a blog post, the text is judged more on the content and substance it delivers rather than the specific medium it is delivered through.

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