



iCampus Student Prize Submission Document

Project Name

STEMid

Contact

Ignatius Chen; Ignatius -at- mit -dot- edu

Need

Students looking for STEM internships, either for the summer or an academic semester, currently have no easy way to search for them. A student leaning toward a computer science major at MIT, for example, would have to look up individual university websites and individual company websites to find a CS internship opportunity. Once students have manually found links to these internship listings, they then submit separate applications to the various program coordinators. The problem now is that seeking out STEM internship opportunities is rather like trying to find a needle in several haystacks. It is a tedious, time-consuming and highly serendipitous process. Currently, there isn't a single web portal that aggregates all possible STEM internships from small startups to large biotech firms to universities to government agencies like NASA.

At the public policy level, much has been said recently about the shortage of STEM graduates and competencies. In addition, the attrition rate of STEM majors is very high: among freshmen that enter a STEM field, only 37% complete a STEM degree. Half of the 55% that leave STEM fields switch to a non-STEM field while the other half leaves university without any credentials altogether. One of the reasons cited for this trend is the lack of engagement and ensuing disenfranchisement due to the dry and abstract nature of introductory STEM courses, leading students to lose sight of why they wanted to be scientists and engineers in the first place. Engaging students in "doing science" is seen as a key antidote to improving STEM major retention rates, as recommended in the latest report by the President's Council of Science and Technology Advisors (PCAST). STEM internships provide students with this hands-on opportunity to see what science is really like in the lab or in the real world, where they can solve real problems.

Description

STEMid (STEM internship database) is a web platform that aggregates STEM (Science, Technology, Engineering and Mathematics) internship listings scattered across the internet with a web 2.0 user interface. It seeks to be a two-sided portal connecting students and applicants to STEM internship providers, while streamlining the application process. For students, STEMid offers tools to save and compare positions, filters (location, research topic and level) and ways to keep track of application deadlines. For internship providers, both academic and commercial, STEMid enables administrators to post internship listings and integrate the database with their

own internal IT systems, thus offering a way to manage their listings in real-time. Furthermore, it provides institutions with control over accessibility to various listings by restricting or granting access to specific groups of applicants. For example, “internal” apprenticeship positions in a biology wet lab at the MIT Department of Biology may be found and seen on STEMid only by students that have a mit.edu email address.

Currently, we have built a two-sided marketplace that has indexed several hundred academic STEM internships. Students can filter by location; say if an MIT undergraduate wants a change of scenery for the summer, he can find a list of internships available in California. Alternatively, a student who knows she is passionate about marine biology would likely not care where the internships are located, so she can filter specifically for “marine biology” listings using our search-by-topic functionality. Each internship is tagged on our database with the relevant research topics to allow students to filter; a neuroscience lab for example, might use genetics or molecular biology tools, and as such we curate this link by tagging it with “genetics” in addition to “neuroscience.” The search field also features query suggestions, so if one types in “ge,” a drop-down suggestion list appears with “General Agriculture, General Engineering, Genetics, Geology, etc.” Other filters help students find opportunities geared toward pre-med, minority and international students.

Focusing on STEM will allow us to cater to the needs of STEM students potentially looking into a STEM career down the road by integrating resources and information on things like scientific conferences and scholarships. Other second generation advancements include the possibility of integrating a social network within our internship database, where self-appointed mentors (e.g. scientists in academia) form nodes in this network, to advise students on a variety of STEM-related issues.

Impact

By reducing many haystacks to just one and providing tools to help MIT students zoom in on the “needle,” STEMid will make the search for STEM internships far more efficient and effective. While it is likely that the biggest benefit would be enjoyed by the 23% of the incoming cohort of freshmen who major in STEM, our goal is also to offer non-STEM majors access to STEM internships in order to allow them to gain STEM competencies and perhaps even become STEM graduates in the future. STEMid will also significantly improve the match between applicant interests/capabilities and internship provider needs.

Due to network effects at play, STEMid might also increase enrollments in STEM internships and the total number of internships offered nationally per year. For instance, small biotech startups that traditionally have to rely on word of mouth to acquire a college summer intern will now have a centralized database to list the position, to compete for applicants with the Fortune 500s. Companies that see benefits such as lower entry-level recruitment costs that might result from being able to recruit directly from its undergraduate engineering internship program, could very well decide to offer more internship positions.

We might also see more students choosing to pursue STEM majors at MIT. Many MIT STEM majors tend to secure internships in finance or management consulting, mostly because these companies come to the university to recruit. STEMid lowers the energy barrier, allowing MIT STEM majors to find science/engineering internships more easily, get in touch with senior scientist/engineer mentors who can advise them on a STEM career path, hence increasing the likelihood that STEM majors actually pursue STEM careers.

Overall, STEMid will help to lower the MIT and national STEM attrition rate, produce more students with STEM competencies to better prepare them for entering a knowledge-based economy, and graduate more scientists and engineers that have the hands-on training and experience to meet the growing demand.

Scale up

To date, we have indexed and hand-curated 400 internships, 289 of which can be seen on the database for now because they have explicit application deadlines. We plan to integrate this with Google Calendar so that students who save internships on their profile can export the deadlines to their personal calendars. To accelerate and scale up the database population, we intend to use Amazon's Mechanical Turk to crowd source the database population task. Meanwhile, we are also building CMS powered site with a custom web form so that internship providers (e.g. program coordinators or HR managers) can upload their own internship listings. Additionally, we will also be expanding our user base by reaching out to university science departments and using social media.

Team

Ignatius Chen is junior at MIT majoring in chemical engineering. As the COO of STEMid, he oversees the vision/growth strategy, marketing/branding, expanding STEMid's user base, gathering feedback from users and creating partnerships and collaborations with industry providers. Ignatius has also been working on the product development collaborating with various developers to improve the backend and server architectures of the site itself.

Roodolph St. Pierre is a chemist in Dr. Jay Bradner's Lab at Harvard Medical School. STEMid was originally Roo's idea; he is now the product lead, and overseer of the user experience and interface for STEMid. He is also working on business development.

Melissa Choi is an assistant computational biologist at the Broad Institute. She has a degree in quantitative biology from Boston University and was a Beckman Scholar. She is the CFO and mainly deals with business plans and financial strategy. She is focusing on building partnerships with universities and non-profit organizations like Science Club for Girls and Change The Equation to further bolster both demand side users and supply side opportunities.

Marc-Dannie is a software engineer at the Broad Institute of Harvard & MIT in Jill Mesirov's bioinformatics group. She is the web developer and main programmer for STEMid.

License

GNU Lesser General Public License, version 3.0 (LGPL-3.0)

Working Prototype/Functional Implementation

<http://www.stemid.org/main.html#main>

Please register and create an account in order to see the complete functionality of the website

Software requirements and dependencies

Not Applicable.