

Introduction

With the growth of social networking services such as LinkedIn and Facebook, one wonders if there is a way to incorporate such enthusiasm to design a service that utilizes the resources and knowledge of those in academic and research fields. For example, a professor might not know that someone else in a different department at his or her university shares a similar research focus. If a program were available to easily locate such people, it could make research more efficient by augmenting previous time spent finding such people via the Internet or various departmental websites. This would ideally increase participation among faculty given they can quickly inquiry about people of similar interest in a unified experience without having to leave Academica. Faculty can also identify the grants and funding a person receives to identify a person of potential interest to see if they could become a co-investigator on future grants. Such program can assist potential graduate students in their search to find a professor who fits their academic interest. The process to find researchers who fit such interest can be tiring if one does not know where to look. It is difficult to solely rely on ranking or word of mouth to perform such research.

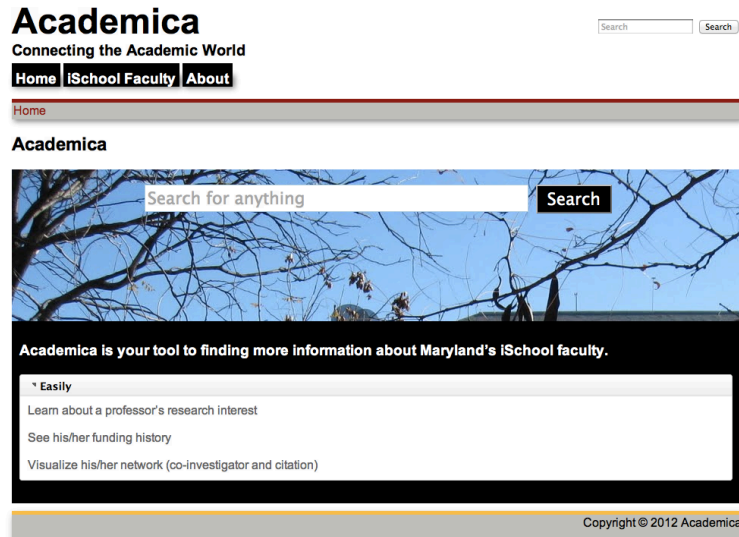
To successfully design a program, it must be capable of automatically generating the content by crawling the Internet and utilizing various APIs. I consider it very unlikely for a professor or researcher to implement such information on his or her own given that during my brief search on Indiana University and Cornell University implementations of VIVO, I found only a few professor profiles that are actually filled out completely. Additional services such as Mendeley do not automatically generate the data and again sees limited use. For a service to be deemed worthy, it must offer an incentive for researchers and professors to incorporate it into their task routine. While I will describe a proof of concept system that I have designed to illustrate the benefits of such a system, I will also describe future goals and current issues of my system called Academica, Latin for Academic. The two demographics that are vital to Academica's success are professors seeking co-investigators and prospective students seeking potential advisors. Academica strives to overcome the difficulty that previous systems suffer from in regards to gaining traction for use. As such, Academica can be summed up as an academic social network without the need for a person to create an actual profile since the system automatically generates profiles for them.

Importance of Academica

The National Institute of Health has allocated a two year \$12.3 million grant to fund, U24 RR029822, VIVO to better embrace social networking technologies in the research world (Conlon, 2010). Clearly, with NIH funding there is a market for Academica. Academics and students have busy lives and such a tool should only require minimal, if any, training for effective use. It must also allow people to fully operate it without entering a myriad of personal and bibliographic information. The program should place a strong emphasis on data visualization to quickly recognize grant funding and what research results from such funding. This is an important attribute to see the primarily funding sources a professor receives. Visually representing data further allows for understanding of trends without reading a long list of grants. While VIVO does offer data visualization, funding and grant information are not available. To successfully gather such data, a tool must be designed to crawl the Internet for easily identifiable information. Limited end-user interaction is essential to warrant success because users are unlikely or unable to perform the additional step to incorporate metadata to ease in finding such data. A possible solution is to crawl people's curriculum vitae and identify the grants people

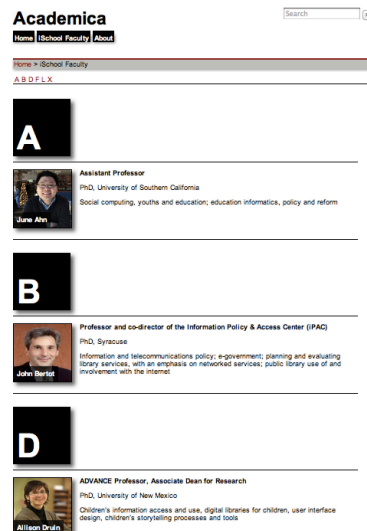
receive through the grant identification numbering system (“NIH Grants Identification Numbering System,” n.d.). There is also the chance for Academica to see if anything could influence the results of his or her research because of a funding source: if one receives funding from Google and the results are adversely bias against Microsoft.

Main Attributes of Academica Home Screen



In designing the home screen, I strive to create an experience that is quick and to the point (no distractions pointing users to different services). From the home screen one is able to type any query regarding what he or she is searching for. In future iterations, I want to include a link that directs users to more information about Academica for further clarification. Lastly, I chose to place trees in the back of the search area to create a scholarly feel.

Faculty Page



The faculty page is available to easily identify, in alphabetical order, which person a researcher or prospective student desires to network with. Basic biographic data is also present on the faculty page to better engage people to seek faculty they may be unfamiliar with. For future iterations, a facet search feature should be included to enhance the page by allowing people to narrow faculty by interest.

Faculty Bio


Home | School Faculty | About

Home > School Faculty > June Ahn

June Ahn – Bio

Bio | Research | Network | Funding & Grants | Publication

June Ahn
School | Assistant Professor



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Research Interest
education informatics
Social computing
youths and education
Policy and Reform

Total Funding to Date: \$566,000
Citations: N/A
Publications: 9

Biography

Education

University of Southern California, Los Angeles, CA
Ph.D. – May 2006
Urban Education

Columbia University, Teachers College, New York, New York
M.A. – 2006
Computing and Education

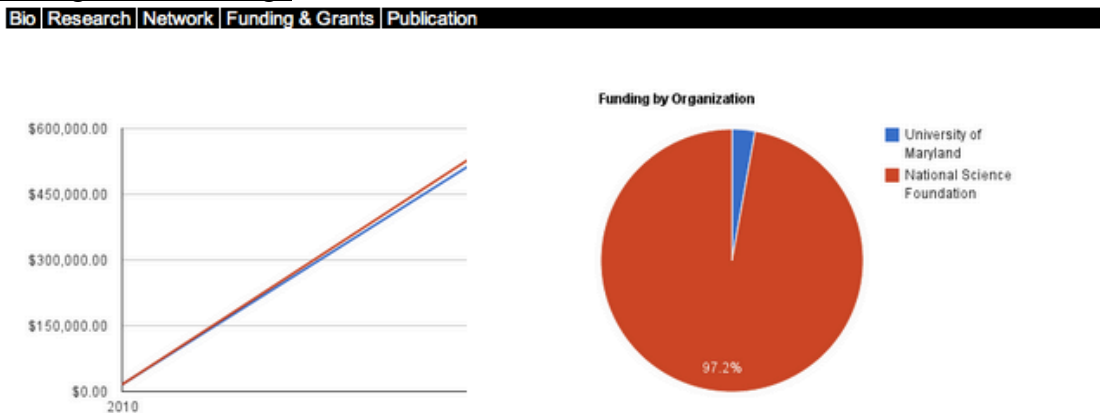
Brown University, Providence, RI
A.B. – 2003
Computing in Education

Recent Publications

2011
[4] Social media access in k-12 schools: Intractable policy controversies in an evolving world (June Ahn, Lauren K Bivona, Jeffrey DiScala), In, 2011. [bib]

The above image depicts a typically faculty bio page. One can see an image of the faculty, from Microsoft Academic Search, with basic contact data. A word cloud is too visible and generated by incorporating tags in one's publication data. The words increase in size depending on its occurrence in the researcher's publications. I also list his or her academic background in the profile.

Funding and Grant Page



Sep 2011 NSF Cyberlearning Grant (\$550,000)
Dec 2010 University of Maryland: Research and Scholarship Award (\$9,000)
Dec 2010 University of Maryland: College of Education SPARC Award (\$7,000)

In Academia's current iteration the above information is hand coded, but in future iterations I hope for it to be dynamically generated via various APIs. The left graph depicts the researcher's

funding by year and overall and the right the graph illustrates the organizations he or she receiving grants from. Both graphs are generated through Google's Chart API.

Publication Page

Academia

Home | School Faculty | About

Home > School Faculty > June Ahn > Publication

June Ahn – Publications

Bio | Research | Network | Funding & Grants | Publication

2011

[9] Social media access in k-12 schools: Intractable policy controversies in an evolving world (June Ahn, Lauren K Bivona, Jeffrey DiScala), In , 2011. [bib]

[8] Policy, technology, and practice in cyber charter schools: Framing the issues (June Ahn), In Teachers College Record, volume 113, 2011. [bib]

[7] The Effect of Social Network Sites on Adolescents' Social and Academic Development: Current Theories and Controversies (June Ahn), In Journal of the American Society for Information Science & Technology, volume 62, 2011. [bib]

[6] Digital Divides and Social Network Sites: Which Students Participate in Social Media? (June Ahn), In Journal of Educational Computing Research, volume 45, 2011. [bib]

2010

[5] What do we know about teachers in charter schools? (Dominic J. Brewer, June Ahn), Chapter in , 2010. [bib]

[4] The Role of Social Network Locations in the College Access Mentoring of Urban Youth (June Ahn), In Education and Urban Society, 2010. [bib] [doi]

[3] The influence of social networking sites on high school students' social and academic development (June Ahn), In , 2010. [bib]

2009

[2] What do we know about reducing class and school size? (June Ahn, Dominic J Brewer), Chapter in , 2009. [bib]

2007

[1] An Introduction to "Early College" (Dominic J. Brewer, Stephanie Stern, June Ahn), In Education Finance and Policy, volume 2, 2007. [bib] [doi]

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BibTeX is the data format that I chose to store a professor's publication data because it can be manipulated easily and is an open standard. The BibTeX data was gathered through Microsoft Academic Search.

Competitors

While the market for research networks is currently immature, it is becoming increasingly competitive with numerous products such as VIVO and Mendeley and search engines such as Microsoft Academic Search and Google Scholar. These services, nevertheless, fail to create a compelling solution that allows for easy data gathering without prior user input. To better understand these issues, a brief description of each competitor is necessary.

VIVO

VIVO is most similar to Academia, as it is an academic social network. Nevertheless, VIVO sees limited use and is only used at seven universities ("About | VIVO," n.d.). VIVO also requires that it be installed on a university's network in order to cooperate with the central VIVO network. This means that if a professor desires to use VIVO, he or she must go through bureaucracy to ask for it to be implemented. Similar to Academia, VIVO has faculty bios, but unlike Academia these bios must be hand coded.

Mendeley

An additional competitor, Mendeley has two primary features as a reference manager and an academic social network. Mendeley is a centralized solution that affords universities little control of the content and is therefore unlikely to see mass use without universities being given more control. Mendeley also sees limited use as seen by the lack of available bios. There is also currently no way to visualize co-investigators or citations, but it does allow for grant and funding information to be displayed.

The Search Engine

Specific search engines are available to assist in finding academic papers for research, yet these programs are not designed for research networking. For instance, Google Scholar's only allows for user biographic data if one creates his or her own biography. This again is not optimal in academic and research fields because of the scarcity of time. Unlike Microsoft Academic Search, Google Scholar also does not afford users an open API.

Frameworks Used

Microsoft Academic Search

An important attribute of Academica is its ability to display co-investigator and citation networks by incorporating data from Microsoft Academic Search. This is an important aspect of Academica because it efficiently allows researchers and prospective students to see the effect a researcher's research has on his or her peers by the number of citations. The data can be parsed through JSON or SOAP, but for the purpose of the project I only incorporated static data from the actual Microsoft Academic Search website.

Google Charts

To visualize the funding data easily I incorporate Google Chart's API because of its integration with Google Documents. Such a feature should be replaced with a hosted graphing API because I came across numerous limitations in Google's Charting system. The system has difficulty rendering specific sizes (height and width), which forced me to depict data in a statically instead of dynamically. If the data were dynamic, people could easily specify and better analyze how much and what funding a person receives from a grant organization. However, the plugin does demonstrate the ideal way I wish for the data to be visualized for users.

WordPress

The backend of Academica utilizes the Wordpress.org content management system for easy input and output of data. I chose WordPress because of its extendibility in plugins and wide user base. Nevertheless, in the actual implementation of Academica, a system of this type is impractical if it wishes to achieve broad ranging influence and use. I also perceive the scalability of WordPress for this purpose to be impractical, as Academica does not incorporate many of WordPress's features, commenting and posting, and it makes more sense to implement a system that is focused from the start for Academica's needs.

WordPress Plugins

wp-publications

An important plugin to parse the bibliographic data I exported from Microsoft Academic Search via the BibTeX reference management format is wp-publications. The BibTeX format is vital since it is not limited to a specific reference style such as APA or MLA, thus allowing those who will utilize Academica to cite information in his or her desired citation format. The plugin also allows for easy linkage of the actual article without performing any search.

Breadcrumb NavXT

An important usability element to identify one's current location within Academica is breadcrumbs. This ensures that if a user is unsure how he or she arrived at a certain point in the application that they can easily revert back to his or her previous position within Academica. Breadcrumbs also help people who may come across a particular page while searching the

Internet or within Academica. This allows people to identify additional features in Academica since they might be unaware of the grant tool or the network analysis tool.

Issues

One of the greatest inhibitors of designing an effective program is my limited experience in JSON and utilizing JavaScript frameworks and more specifically jQuery. I hope that I can eventually implement the many features I describe in a production ready version of Academica or at least further enhance my prototype. Knowledge of JSON and JavaScript is necessary to implement a program that automatically generates the data instead of hand coding such data. Hard coding is time consuming and difficult if one makes mistakes or wishes to quickly add or remove features or information.

Moreover, to design a better faculty page, I hope to utilize the jQuery Quicksand plugin; however, my lack of experience in jQuery inhibits my ability to successfully implement such plugin. As such, if I implement it, then it would be as a faceted search function.

Additionally, I am unsure how I could successfully make a tool that can identify a professor/researcher's future and pending research. Time and lack of ability have made the feature unable to be incorporated fully into this iteration of Academica.

I had mixed views of the Google Charts API since its JavaScript had difficulty displaying the graphics to the standards that I desire. As such, I suggest one use another platform: specifically Prefuse's JavaScript Library or D3.js. Being on my own server and not outsourced to Google will ensure greater reliability and the ability to further alter any feature.

I also tried to incorporate a more powerful, Apache's Solr, search foundation instead of WordPress's built in search engine. I was able to install Apache's Solr properly, but I was unable to enable the crawling functionality of Solr even with a WordPress plugin designed to enable this function. Utilizing Solr would allow for greater flexibility and a more focused search engine experience for end-users.

Future Features

Although I had planned to implement many of the features I am about to describe, a lack of fluency in an object-oriented programming language, JavaScript, hampers my ability to do such. I had gained the rights to utilize Microsoft Academic Search's API to incorporate its powerful backend to dynamically generate how many citations and co-investigators a researcher has to a researcher's profile. I would desire to further incorporate Google Scholar, but Google does not offer developers access to its data through JSON. I also hoped to utilize numerous other APIs such as Mendeley's to augment the results that I receive via Microsoft Academic Search. In contrast to Microsoft Academic Search, Mendeley requires user interaction through profiles for its data to be reliable.

I am confident I can implement a fact search function into future iterations of the faculty page to organize and find potential faculty by interest and not just alphabetically. This would increase user efficiency since he or she would not have to read every faculty member's profile to see if the professor fits the prospective student's interest. To power the feature, I suggest incorporating

the jQuery Quicksand plugin. Quicksand allows for various metadata to be tied to an HTML tag and can be easily modified. I initially tried Eikes's JavaScript Facet Search plugin, but I found it limiting for my needs, as it is not easily customizable and restricts me on how I can apply tags.

To visualization the research networks, I suggest one to utilize Cytoscape Web (<http://cytoscapeweb.cytoscape.org>) given its ability to easily embed data, via GraphML and XGMML, and allow for easily node manipulation ("Cytoscape Web » FAQ," n.d.). The current iteration of Academica only displays static data of how I hope such a feature will be implemented. Network visualization could likewise be incorporated to visualize grant data to see if there are any possible connections between one's ability to receive funding from a specific network and those who fund them. The network tab can also visualize co-investigator networks and citation networks. Such a feature would be helpful for prospective graduate students who can utilize the information to gauge a professor's influence and connections. This data could be similar to how LinkedIn depicts first through third degree connections, however unlike LinkedIn, Academica will show these actual connections (McDaniel, 2007).

Another important feature I suggest is the ability to identify a faculty member's current and previous PhD and master's students to see what success his or her students have achieved. I also wish to create a function, which identifies the most similar and least similar faculty based on a person's research. Such data could be located in the home biographic page to allow for people to easily see and identify additional people who fit his or her research interest. The feature would also identify other non-affiliated researchers who are more and less similar. The best means to identify more and less similar people would be to gauge where and who cite such people (i.e. - journals and conferences research is published in). I consider these traits the most effective means to identify people who are the most and least similar to a person in regards to research. I am sure more data could be incorporated to make a more effective algorithm, but this is a good basis for understanding how to design and implement the feature.

As described in the previous section, Apache's Solr is necessary to improve the search experience specifically if I wish to make Academica on its own non-WordPress platform. Solr is a platform that I have only minor experience with implementing and to better understand one must read its documentation available at <http://lucene.apache.org/solr/>.

The last specific feature I suggest for future iterations of Academica is to incorporate a means to contact the professor or researcher similar to LinkedIn's messaging service. I tried to incorporate the WordPress plugin "BuddyPress." Yet, when I tested the feature it did not meet the capabilities that I desire for my communication feature since it forces responders to have a user name with Academica. Requiring a username is a vital if a contact feature is to be successful given I want as little user interaction with the program as possible. I wish for a system that sends a secured and verified email to the potential recipient to guarantee that he/she reads the message and it does not end up in a spam folder. reCAPTCHA can be incorporated into the contact feature to limit any possible spam a person might receive.

Conclusion

Although I succeeded in incorporating and designing many of the features I wished to be in Academica, I failed at implementing some of the functionality I had promised to include in my proposal. The program is more of an interactive prototype and less of an actual working program because all the data is not dynamic as I had hope. This is because of my basic JavaScript fluency of which many of the frameworks and plugins require an advanced understanding of the language to fully utilize. I am sure with additional time that the features will be integrated into Academica. Conversely, I hope Academica will become a popular academic social network similar to VIVO or at least demonstrate to people the importance of such a tool. As such, much work is still needed to ensure Academica is ready for widespread use, however I still consider that the prototype does succeed at depicting my goal of creating an academic social network.

References

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http://ocga.ucsd.edu/Proposals/NIH/Grants/Identification_Numbering_System.htm