

# iGrads@VT: An iPhone Application for Graduate Recruitment

*Uma Murthy, Ben Hanrahan, Manuel A. Pérez-Quñones, James Henry,  
and Ricardo Quintana-Castillo<sup>1</sup>*

**Abstract** – We present iGrads@VT, an iPhone application that the Graduate School at Virginia Tech is building, aimed at personalizing graduate recruitment information. A potential graduate student might use this application to get personalized information on their academic and extra-curricular interests. We believe that such an application will not only provide the student what he/she needs to make an informed decision about their choice of graduate school, but also will provide them support for the changes and social adjustments needed to succeed in their graduate studies. In this paper, we present the software architecture design and a prototype of iGrads@VT.

**Keywords:** iPhone application, graduate recruitment, personalization

## INTRODUCTION

Selecting a graduate school involves identifying possible departments, degree offerings, financial opportunities, faculty mentors, as well as identifying costs of living, and other aspects regarding social settings of the graduate school of choice. This information is often found on the website of many graduate schools. These websites, however, provide no opportunity for personalizing the content of the website. For any given student, the relevant information constitutes only a small percentage of the information available for all graduate programs. Personalizing this information would make it easier for potential graduate students to access the relevant information while ignoring information that is irrelevant to the concerned student.

The adjustment to graduate school is more than just in the area of academic programs. Students must often undergo social adjustments to be able to “fit in” a different community. The social adjustment is often aided by identifying students with similar social backgrounds and using them as mentors.

With mobile devices gaining popularity [1,2,3], many universities are providing access to information through mobile phone applications, such as iPhone applications (i.e. Stanford University, Duke University, etc.). However, most of these applications are limited to providing standard information (present in websites and brochures) and lack the “personal” touch of connecting with current students, faculty, researchers, alumni, and other potential students. This approach is missing the personalization opportunities of accessing information resources from a personal device such as someone’s phone.

In this paper, we present iGrads@VT, an iPhone application that the Graduate School at Virginia Tech is building aimed at personalizing graduate school information and providing support for the social adjustment required to succeed in graduate studies. The iPhone application provides personalized information on the potential graduate student’s academic and extra-curricular interests, which is targeted and relevant to the student, instead of being general information about the university and its graduate programs. We believe that such an application will not only provide the student what he/she needs to make an informed decision about their choice of graduate school, but also will provide them support for the changes and adjustments they need to succeed in their graduate studies. The iPhone application will be available for free at the Apple Store and similar functionality will be available on a specialized website (for those students that don’t have an Apple iPhone or iPod Touch).

## USAGE SCENARIO

To motivate the design of iGrads@VT, we developed several scenarios describing the use of iGrads@VT by a potential Graduate student. One such scenario is as follows:

---

<sup>1</sup> Department of Computer Science, Virginia Tech, Blacksburg VA 24061  
{umurthy, bhanraha, perez, henryja, rqc}@vt.edu

Sama is a trainee architect working in a design organization in Washington D.C. After gaining some experience, she is now keen to pursue an advanced degree in architecture, especially in the area of sustainability design. She is considering Virginia Tech's (VT) graduate program in Architecture due to its well-established faculty and a strong sustainability research group. At the VT graduate school website, Sama completes a short candidate interest form, indicating her degree of interest as well as other details. Later, she is provided with a PID<sup>2</sup> to access various VT websites, including iGrads@VT, the VT graduate school personalized website which provides information to potential graduate students about their academic and extra-curricular interests. This website has a link to download a free iPhone app to access this information in her phone. This is really good for Sama as she is often on the move and it will help her learn more about the graduate programs in architecture as well as life in VT. Sama uses her PID code to login to the application. The application has many categories of information to browse through, including courses, news, people, events, etc. Upon selecting "courses", iGrads@VT shows her a list of courses in the department of architecture as well as cognate courses from other departments such as civil engineering. This is useful as she can quickly go through the graduate courses offered in architecture as well as relevant cognate courses. Also, she can browse through a master course list to add more courses to this personalized list of courses. In the "news" category, Sama sees a list of general news as well as architecture-related news at VT. The "people" category provides her a list of contact persons in the architecture programs, including department head, and the graduate program coordinator and director. This is very useful as she can directly email or call the appropriate person when she needs more information. Under the "events" category, she sees that app loads events in the architecture department and from the triathlon club (based on information she filled in her form). In each category, there is an initial personalized list, which Sama can edit at any point adding items of her interest (or deleting the ones she does not want). iGrads@VT brings all the required information in one place, without overloading Sama with unnecessary information. Thus, iGrads@VT turns out to be a useful app, providing her targeted inputs that help her make a decision about going to the graduate school at Virginia Tech.

## **IGRADS@VT IPHONE APPLICATION**

### **Application Features and Interface**

Figure 1 shows screenshots of the current prototype of the iGrads@VT iPhone application. We will use the scenario mentioned above to describe the application features. We assume that Sama (the user in the aforementioned scenario) has logged into the application with a PID provided by the Virginia Tech Graduate School. Figure 1-a shows the welcome screen with three categories – people, courses, and news – and a logout button. Also there is a recent video on this screen, which could be a news item, an interview, a video tour, etc. Upon selecting the Courses category from the main screen (Figure 1-a), Sama is shown a list of relevant courses offered by the Architecture department (Figure 1-b). She can browse through this list and see details as well (Figure 1-c). To learn more about the current happenings at Virginia Tech, Sama selects the News category from the main screen. She gets a display of a list of news feed categories (Figure 1-d), including general Virginia Tech news as well as news in the Architecture and related (Arts) departments (highlighted in the figure). She can browse through feeds in a particular news category (Figure 1-e), read details (Figure 1-f) as well as go the original news page (Figures 1-g and 1-h). Upon selecting the people category, Sama is shown a list of contact people in the architecture department (Figures 1-i and 1-j). She can contact the people on this list to get more information about the architecture graduate degree programs. Also, she can add more people to this list (by clicking on the top-right "Add" button in Figure 1-j), which could include professors she might want to work with, graduate students with similar interests, etc. Finally, she can add a person's details to her contacts list in the iPhone (Figure 1-k).

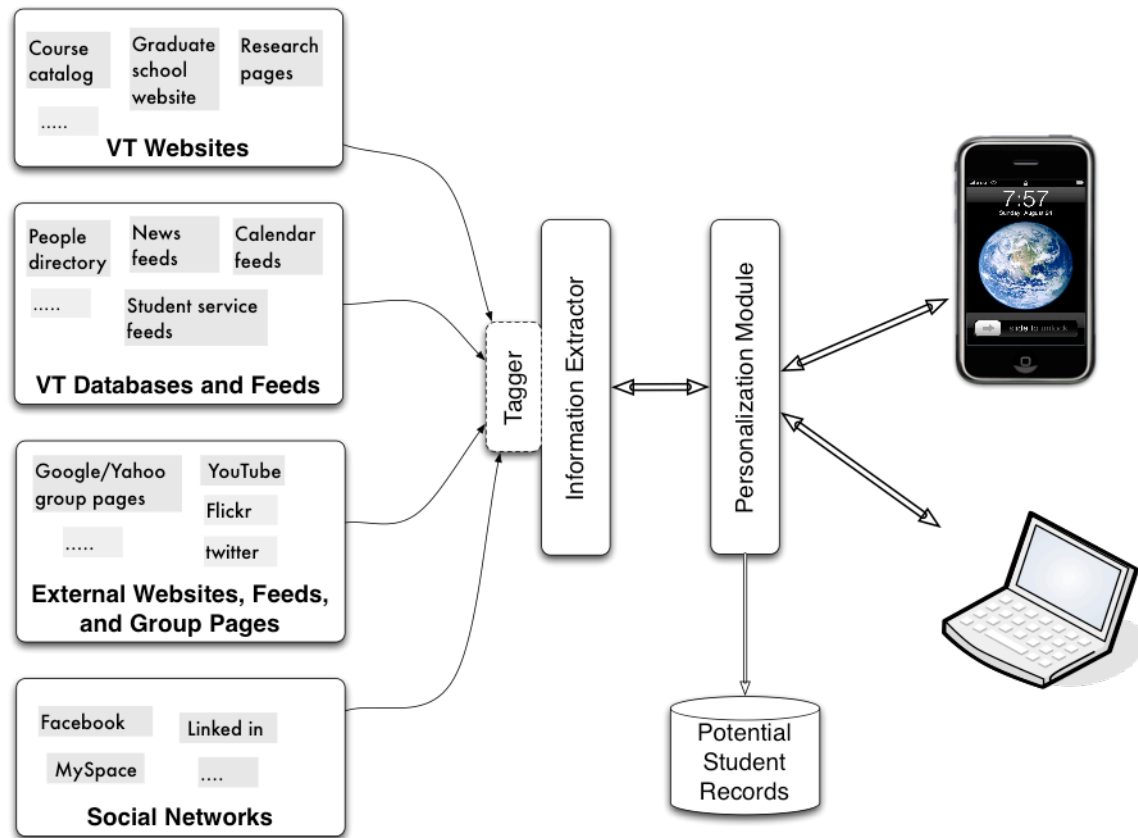
---

<sup>2</sup> A PID is a personal identification code, used as a unique identifier.



Figure 1. Screenshots of the iGrads@VT iPhone application interface: a) Welcome screen; b) Personalized course list; c) Course detail; d) News feed categories list, with personalized categories; e) News feed list in a category; f) News detail; g) Option to view news item in browser; h) News item in browser

## Application Architecture



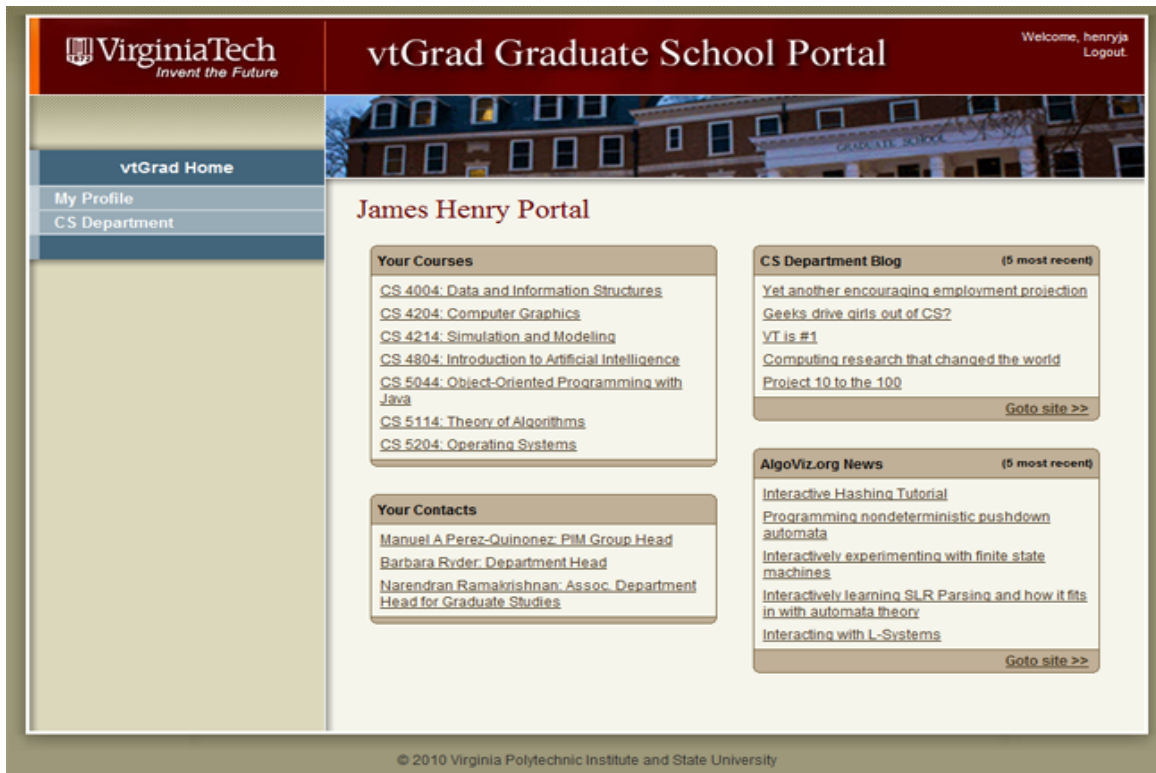
**Figure 2. Software architecture design of the iGrads@VT iPhone application.**

The rationale behind the software architecture design of iGrads@VT is to make use of existing websites and RSS feeds as much as possible so that the iPhone application itself stores little (if any) of this information. Also, the same information is available on a website (Figure 3) for students to access via laptops and desktops. Data sources include information in:

- Virginia Tech (VT) websites such as the course catalog, the VT graduate school website, department research pages, etc.
- VT databases and news feeds, such as VT news RSS feeds, VT events calendar feeds, the VT people directory, Graduate School communications, etc.
- External websites, blogs, news pages, feeds, etc., relating to VT and VT graduate students such as Google/Yahoo groups, YouTube feeds, Flickr feeds, Twitter feeds, etc.
- Information in social networks, such as Facebook, MySpace, Linked in, etc.

The architecture is flexible and extensible to pull content from other relevant data sources as they become available. We make use of a middle layer to filter and personalize content from data sources based on the potential graduate student's profile. This profile is obtained through a simple paper or web-based form<sup>3</sup> that the potential student

<sup>3</sup> Currently, we use a paper-based form. Development of the web-based form is in progress.



**Figure 3. Screenshot of the personalized website**

completes when they indicate interest in a graduate program at VT. Besides basic facts about the potential student, the form elicits other information, such as degree of interest, organizations and groups of interest, etc. The middle layer filters courses, events, news, etc. based on the potential student's profile information, resulting in personalized and targeted information that will be of interest to the potential graduate student. Later, the student might add or delete items in the recommended list. The architecture has provision for a tagger (connected to the information extractor), which might be used to tag content from these sources with a consistent set of tags that cover a basic set of activities. This information might then be used for personalizing communications to students. Common set of activities include academic, student life, services, ethnic groups (African-American, Hispanic, Latinos, etc.), religious groups (Christian, Muslim, Jewish, etc.), as well as other more specific tags. This extra set of information can be filtered somewhat automatically by the information extractor and presented to the student only if it matches the student's profile. Some tags might match all profiles (e.g. academic information), others might match only personalized profile features (e.g. specific religious activity). In the future, we also plan to develop functionality for a potential graduate student to edit this profile, thus enabling them to see more information.

We developed technical specifications for iGrads@VT based on the existing structure of content in data sources and on the method we might use to extract that information to display it on the iPhone. For example, consider the VT graduate course catalog. Based on a set of data fields, it might be represented as an XML file (such as the snippet shown in Table 1). This information is parsed and displayed in the iGrads@VT interface (Figures 1-b and 1-c). Similarly, an RSS feed has a standard set of data fields that might be parsed and displayed. For people search and a list of contacts, we use VT's Enterprise Directory [4], which is the current generation of the VT LDAP directory (VTLDAP). VTLDAP enables programs to get information available in the VT's people directory, while protecting the privacy of University faculty, staff, and students more effectively. Table 2 shows the personalized information structure (represented in an XML file) for a potential graduate student based on their profile. Such a personalized file might be generated by filtering the information in data sources based on the graduate student's profile. The current prototype has the "People", "Courses", and "News" categories. Note that most of the information displayed

in the iGrads@VT interface is not stored in the phone itself. Instead, it is either is stored on a server or is pulled directly from a data source.

**Table 1. Course information represented in XML files. The left column shows the information structure of the list of disciplines and the right columns shows the information structure of the list of courses.**

<pre> &lt;DISCIPLINES&gt;   &lt;DEPARTMENT&gt;     &lt;ABBR&gt;AAEC&lt;/ABBR&gt;     &lt;TITLE&gt;Agricultural and Applied Economics&lt;/TITLE&gt;   &lt;/DEPARTMENT&gt;   &lt;DEPARTMENT&gt;     ...   &lt;/DEPARTMENT&gt;   ... &lt;/DISCIPLINES&gt; </pre>	<pre> &lt;COURSES&gt;   &lt;COURSE&gt;     &lt;DISCIPLINE_CODE&gt;CS&lt;/DISCIPLINE_CODE&gt;     &lt;COURSE_NUM&gt;CS4004&lt;/COURSE_NUM&gt;     &lt;LEVEL&gt;G&lt;/LEVEL&gt;     &lt;LEVEL&gt;UG&lt;/LEVEL&gt;     &lt;TITLE&gt;Data and Information Structures&lt;/TITLE&gt;     &lt;INSTRUCTION_TYPE&gt; Lecture &lt;/INSTRUCTION_TYPE&gt;     &lt;CREDIT&gt;3&lt;/CREDIT&gt;     &lt;DESCRIPTION&gt;       This course emphasizes the understanding of data       structures and algorithms...     &lt;/DESCRIPTION&gt;   &lt;/COURSE&gt;   &lt;COURSE&gt;     ...   &lt;/COURSE&gt;   ... &lt;/COURSES&gt; </pre>
---	--

**Table 2. Structure of personalized information. Courses has a list of courses as shown in Table 1, people as a list of identifiers of contact persons, and news has a list of news feed categories.**

<pre> &lt;PERSON_GRAD id="sama"&gt;   &lt;COURSES&gt;     &lt;COURSE&gt; &lt;/COURSE&gt;     ...   &lt;/COURSES&gt;   &lt;PEOPLE&gt;     &lt;PERSON uupid="kclarke"&gt;Kathryn Clarke&lt;/PERSON&gt;     &lt;PERSON uupid="mermann"&gt;Michael G Ermann&lt;/PERSON&gt;     &lt;PERSON uupid="stthomp2"&gt;Steve Thompson&lt;/PERSON&gt;   &lt;/PEOPLE&gt;   &lt;NEWS&gt;     &lt;NEWS_FEED&gt;       &lt;TITLE&gt;Virginia Tech&lt;/TITLE&gt;       &lt;RSS&gt;http://www.vtnews.vt.edu/VTNhomeStories.rss&lt;/RSS&gt;     &lt;/NEWS_FEED&gt;     ...     &lt;NEWS_FEED&gt;       &lt;TITLE&gt;Architecture &amp; Urban Studies&lt;/TITLE&gt;       &lt;RSS&gt;http://www.vtnews.vt.edu/newsaus.rss&lt;/RSS&gt;     &lt;/NEWS_FEED&gt;     ...   &lt;/PERSON_GRAD&gt; </pre>
--

## CONCLUSION AND FUTURE WORK

We presented iGrads@VT, an iPhone application providing personalized and targeted information to a potential graduate student. The personalization caters information relevant to the potential student's academic and extra-curricular interests to help her/him learn more about Virginia Tech's graduate degree programs. The current iGrads@VT prototype has functionality to personalize courses, news, and a list of contacts for a potential graduate student. The software architecture design of iGrads@VT is flexible and extensible to include other data sources and filtering techniques in the future.

Future work on iGrads@VT includes development of new categories to present content from data sources, including blogs, events calendar, twitter feeds, social networks, etc.

## REFERENCES

- [1] App Store Market Worth Nearly \$2.5 Billion Per Year?, <http://www.macrumors.com/2009/08/27/app-store-market-worth-nearly-2-5-billion-per-year/>
- [2] New research on the demographics and behavioral characteristics of iPhone And iPod touch users from AdMob and comScore, <http://blog.admob.com/2009/06/16/new-research-on-the-demographics-and-behavioral-characteristics-of-iphone-and-ipod-touch-users-from-admob-and-comscore/>
- [3] Smartphone and iPhone Demographics from Nielsen, <http://bitbriefs.com/2009/09/20/smartphone-and-iphone-demographics-from-nielsen/>
- [4] Enterprise Directory, [http://www.cAppStoreMarketWorthNearly\\$2.5BillionPerYear?](http://www.cAppStoreMarketWorthNearly$2.5BillionPerYear?http://www.macrumors.com/2009/08/27/app-store-market-worth-nearly-2-5-billion-per-year/), <http://www.macrumors.com/2009/08/27/app-store-market-worth-nearly-2-5-billion-per-year/>

### Uma Murthy

Uma Murthy is a Ph.D. candidate in the Department of Computer Science at Virginia Tech. Her dissertation research focuses on understanding use of parts of documents in scholarly tasks and developing electronic tools to support such tasks. Her other research interests include image retrieval and personal information management. Uma is a student member of ACM and the Upsilon Pi Epsilon honor society.

### Ben Hanrahan

Ben Hanrahan is a Ph.D. Student in the Department of Computer Science at Virginia Tech. His research is in situating personal information management in social/organizational structures and contexts. In the past, Ben has managed software projects and has performed various duties including UI design, designing architecture, performing code reviews, and handling feature assignments.

### Manuel A. Pérez-Quinones

Manuel A. Pérez-Quinones is Associate Dean for the Graduate School and Associate Professor in Computer Science at Virginia Tech. He has a D.Sc. from George Washington University. His research is mostly in applied areas of HCI. He is a member of the Coalition to Diversify Computing, ACM, IEEE Computer Society.

### Ricardo Quintana-Castillo

Ricardo Quintana-Castillo is a Ph.D. Candidate in the Department of Computer Science at Virginia Tech. In his dissertation research, he is studying human activities that prompt the use of iPhone for producing and consuming information. Ricardo is a recipient of the National Science Foundation (NSF) Graduate Research Fellowship and a student member of ACM.

### James Henry

James Henry is a masters student in the Department of Computer Science at Virginia Tech. His thesis research is in the development of platforms to support ubiquitous hardware and applications. His other research includes the effect of level of immersion on spatial knowledge. James is a member of the Upsilon Pi Epsilon honor society.