Technology and Graduate Education

Andrew Comrie, University of Arizona
Karen P. DePauw, Virginia Tech

Council of Graduate Schools Annual Meeting
December 2011
Scottsdale, Arizona
21st century graduate school

- Challenge to improve functionality
- Explore technology tools for enhancing operations
- Create innovative communication strategies; use of social media
- Manage information and data
- Understand technology and how it informs and enhances learning
This session is designed not only to provide an overview of tools and strategies utilized by current graduate deans and to share effective practices, but also to facilitate discussion about technology changes and learning paradigms important in graduate education.
An Opportunity

- Universities and Graduate Schools
  - Confluence of generations
  - Technological advancements
  - Conceptual Age (Daniel Pink)

- Graduate students - evolving needs and perspectives, social networking

- Graduate Schools – responsive, interactive, integrative, inclusive & innovative

- Graduate dean - architect of communities
Sustained investment in IT ($=mostly people, especially web developers/programmers)
- Have grown IT, even with layoffs of other staff

Enterprise system replacement → Peoplesoft
- BUT, no system has all the features; need to augment with unique graduate school elements

Today:
1. Applications/Admissions/Evaluation
2. Analytics
If you have never used this online application, please create an account. If you forgot your password, please use our login credential retrieval tool.

All applicants must have unique and individual email address to use this system. If you are an Agency applying for multiple applicants, please be sure to create individual email addresses and accounts for each applicant.

If you know your login information, please login here:

Email: [Enter email]
Password: [Enter password]

Login

Forgot your password?
Welcome to the University of Arizona Graduate College Online Application.

**Applicant Workflow**

- **Task List**
  - Complete My Application:
    - Geography PhD Fall 2011
      - 1. Recommendations
      - 2. Pay Application Fee
      - 3. Review Application
      - 4. Submit Application

- **My Profile**
  - Personal Info
  - Previous Education

- **My Applications**
  - Geography PhD Fall...
  - Apply to a program

**My Applications**

<table>
<thead>
<tr>
<th>Program / Semester</th>
<th>Supplemental Questions</th>
<th>Letters of Recommendation</th>
<th>Payment</th>
<th>Submitted</th>
<th>Action(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geography PhD Fall 2011</td>
<td>-</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>delete</td>
</tr>
</tbody>
</table>

- **Go to the next item on your Task List**
  - Add Recommendation Contacts for Geography PhD Fall 2011

- **Apply to a Program**

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*Note: The image contains a screenshot of an online application process with task lists and application sections.*
Dept/Program Detail

Department Requirements

Statement of Purpose
- Official transcripts from all institutions attended
- At least 2 letters of recommendation, 3 preferred
- Photocopies of GRE scores
- Photocopies of TOEFL scores from International Students
- Photocopies of TSE scores from International Students (optional)

Please send your documents to:
Linda Koski
Dept. of Geography and Reg. Dev.
University of Arizona
P.O. Box 210076
Tucson, AZ 85721

[Express shipping address for DHL, Fed Ex, UPS is 1103 E. 2nd Street, Room 409. Phone number is (520) 621-1652.]

Deadline for this application: January 15

Admission Questions: (520) 621-7486
Application Contact Person: Linda Koski
Department Website: http://geog.arizona.edu/
Department Phone: (520) 621-1652
Department Fax: (520) 621-2889

You may also wish to refer to the Program Description for Geography.
All required recommendations have been added.

To apply to this program, two (2) Letter(s) of Recommendation are requested. Please provide contact information for them using the link below. Click the Send email link when you are ready to send your Request for Recommendation to the recommender. This system will automatically generate the Request for Recommendation email to the person and email address you have provided. If, after sending this email, you need to make a change, please contact the program to which you are applying.

You may check on the status of your recommendations at any time through this same Recommendations area of the online application.

**ADDITIONAL INSTRUCTIONS:**
The School of Geography and Development would like to receive 3 letters [2 letters are required] of recommendation from academic sources. Department Contact: Linda Koski lkoski@email.arizona.edu

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Status</th>
<th>Action(s)</th>
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<tbody>
<tr>
<td>No recommenders configured.</td>
<td></td>
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<tr>
<td>Add a recommender</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Go to the next item on your Task List »

- Pay the application fee for Geography PhD Fall 2011
Over 80% of programs now use the program application modules.

Each program customizes its own optional questions and extra documentation.

Coming soon, upload:
- audio files
- videos
On this page you can edit information that affects your program's Online Application:

1. Applicant Instructions
2. Semester Restrictions
3. Letters of Recommendation
4. Program-level Questions

Applicant instructions for the Computer Science PhD program

Thank you for your interest in The University of Arizona Department of Computer Science. Your application will be considered once you have submitted all required documentation. Incomplete applications will not be reviewed and will be automatically denied. Paper applications will no longer be accepted, please submit all materials via this online application.

DO NOT send hard copies of the application materials unless specifically requested by the department in a separate email.

Please contact Computer Science Graduate Admissions if you have specific questions, gradadmissions@cs.arizona.edu.

Admission decision notification will be sent via email in March for a fall semester applicants. Please do not call the department regarding the status of your application, we will notify you via email as soon as a decision has been reached.

Information regarding the department, our faculty, and the courses we offer can be found at http://www.cs.arizona.edu/graduate/

Save instructions
Restrict the semesters that people can apply to this program

You can configure the Graduate College online application so that it will not allow people to apply to this program for certain semesters. Using the form below, you can easily configure this program to not accept applications for a generic semester (for example, Fall or Summer I) or for a specific semester (for example, Fall 2008 or Summer I 2009).

Current Semester Restrictions
You can delete any restrictions that are currently configured by clicking the associated "delete" link

- No Summer II Admission  delete
- No Summer Admission  delete
- No Fall 2010 Admission  delete
- No Spring Admission  delete

Add an application rule:
(choose a rule from the drop-down and click the 'Add Rule' button below.)

No Spring Admission  Add Rule
Recommendation Letter Interface

**Text for Applicant Instructions**

The department requires each applicant to have a minimum of two letters of recommendation submitted on their behalf. The two letters of recommendation should be written by faculty that can speak about your academic and research ability. Please have your recommenders submit their letters through this mechanism. Should you or the recommender have questions, please email gradadmissions@u.arizona.edu.

**Text for Recommender Instructions**

The department requires each applicant to have a minimum of two letters of recommendation submitted on their behalf. The recommendation should be written by faculty or someone that is familiar with the applicant's academic and research ability. Should you have any questions, please email the department directly, gradadmissions@u.arizona.edu. The preferred method to receive the letter is through this mechanism, however, if that is not possible please send a hard copy on letterhead with original signature to: Department of Computer Science Attn: PhD Graduate Admissions 1540 E. 4th Street, Gould Simpson 991 Tucson, Arizona 85719.
Program-Specific Questions

- Statement
- GRE
- Transcripts
- Extra questions, e.g.:
  - Interest areas
  - Special essay
  - Written work samples
  - Etc.
22. **Area of Interest and Faculty Advisor:** The most important thing you can do is to make sure your research interest fits within our program. Please take the time to determine if our faculty’s area(s) of research match your own interests. Finding a good fit between you and a faculty mentor will be critical to your success in graduate school. Please review our faculty members and their research interests on our web site, [http://www.cs.arizona.edu/personnel/faculty.html](http://www.cs.arizona.edu/personnel/faculty.html). This will give you a good sense of what they and their students are researching. Please do not contact the faculty member directly for funding or research opportunities. All faculty members are shown the applications for those students that have indicated they are interested in their specific areas of research.

23. From the drop-down menu, please tell us your primary area of interest in Computer Science. (*)

24. Please tell us your second area of interest in Computer Science (*)

25. Please tell us your third area of interest in Computer Science (*)

26. Please list your top three choices for faculty advisors.

- Algorithms
- Artificial Intelligence
- Compilers
- Computational Biology
- Computational Geometry
- Computer Vision
- Database Systems
- Data Mining
- Distributed Computing
- Embedded Systems
- Graphics
- Machine Learning
- Network Systems
- Operating Systems
- Parallel Computing
- Program Optimization
- Programming Language

- Drop-down choices
- Area of interest
- Faculty advisor
Update Program Description Guide for: Computer Science PhD

On this page you can edit information that affects the Program Description Guide.

Application Information

Contact Information

Application Website: http://www.cs.arizona.edu/graduate/applicationinformation.html

Advising Questions

<table>
<thead>
<tr>
<th>Name</th>
<th>Linda Erasmus</th>
</tr>
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<tr>
<td>Phone</td>
<td>(520) 621-4049</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:erasmus@cs.arizona.edu">erasmus@cs.arizona.edu</a></td>
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Application Questions

<table>
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<tr>
<th>Name</th>
<th>Linda Erasmus</th>
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<tbody>
<tr>
<td>Phone</td>
<td>(520) 621-4049</td>
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<td>Email</td>
<td><a href="mailto:gradadmissions@cs.arizona.edu">gradadmissions@cs.arizona.edu</a></td>
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Recommended Deadlines

Domestic Students

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International Students

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<th>January</th>
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<tbody>
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See Applicants & Status

### Student Application Summary

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<tr>
<td></td>
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<td>Int</td>
<td></td>
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### Monitor / View Letters

- Download as CSV
## Submitted Application

### Application Summary

<table>
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<td>Department:</td>
<td>Computer Science</td>
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<tr>
<td>Type of Student:</td>
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<td>Payment:</td>
<td>$75.00 on October 28, 2010, 10:49 am (order number 1288288176368)</td>
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<tr>
<td>Submitted:</td>
<td>2010-10-29 09:14:05</td>
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### Biographical Data

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<tr>
<td>Gender:</td>
<td>Male</td>
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<tr>
<td>Birth Date:</td>
<td></td>
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<tr>
<td>Cell Phone:</td>
<td></td>
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<tr>
<td>Email:</td>
<td></td>
</tr>
<tr>
<td>Veteran:</td>
<td>No</td>
</tr>
<tr>
<td>Arizona Resident:</td>
<td>No</td>
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</table>
Monitor/View Letters

Recommendations for Computer Science PhD Fall 2010

- All *required* recommendations have been requested by the applicant. (NOTE: This does not necessarily mean they have been received by the online application.)
- If a recommender has responded but an error in the recommendation needs to be corrected, you may *unsubmit* the recommendation, which will delete the existing document and allow the recommender to upload a replacement.
- For more detailed information about the Letters of Recommendation module, please read our [Online Documentation](#).

<table>
<thead>
<tr>
<th>Recommender Name</th>
<th>Invite Email</th>
<th>Preferred Email</th>
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<td>Recommender has responded</td>
<td>View</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Recommender has responded</td>
<td>View</td>
</tr>
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</table>
Coming Soon…

- Faculty score/comment admissions review
- Degree progress/audit
  - Currently have pre-populated PDF forms for hardcopy signatures
  - E-signatures soon for plan of study, comps exam, proposal, defense, etc.
  - Simple program coordination functions: email reminders to students, due dates, auto-audit, etc.
Grad Analytics

- Data and Analyses for Grad School staff & Dept/Program faculty/staff
  - Point-in-Time Application, Admit and Enrollment Data (weekly census)
  - Program Data (NRC variables, all Masters/PhD)
  - Graduate Programs Assessment (internal review)
  - National Data Sources (CGS, SED, etc.)
# Program Assessment

The University of Arizona caters to the assessment of research programs, ensuring rigorous standards are met.

## PhD Programs not Included in National Research Council (NRC) Assessment of Research

### Completion Rates

For a comprehensive look at completion rates, the table below outlines the data for various programs:

**Completion Rates** (includes all students—both part-time and full-time)

<table>
<thead>
<tr>
<th>Program</th>
<th>All</th>
<th>Male</th>
<th>Female</th>
<th>Median Time to Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology &amp; Linguistics</td>
<td>11</td>
<td>3</td>
<td>8</td>
<td>3.50</td>
</tr>
<tr>
<td>Arid Lands Resource Sciences</td>
<td>18</td>
<td>10</td>
<td>8</td>
<td>5.25</td>
</tr>
<tr>
<td>Comp Cultural &amp; Literary Studies</td>
<td>29</td>
<td>6</td>
<td>23</td>
<td>6.00</td>
</tr>
<tr>
<td>Educational Leadership</td>
<td>86</td>
<td>36</td>
<td>50</td>
<td>5.00</td>
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<tr>
<td>Educational Psychology</td>
<td>45</td>
<td>13</td>
<td>32</td>
<td>4.00</td>
</tr>
<tr>
<td>Entomology</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>8.50</td>
</tr>
<tr>
<td>Family &amp; Consumer Sciences</td>
<td>33</td>
<td>10</td>
<td>23</td>
<td>6.00</td>
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<tr>
<td>Higher Education</td>
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<td>Insect Science</td>
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<td>4</td>
<td>6.50</td>
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<tr>
<td>Information Resources &amp; Library Sci</td>
<td>8</td>
<td>6</td>
<td>2</td>
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<tr>
<td>Language, Reading &amp; Culture</td>
<td>114</td>
<td>32</td>
<td>82</td>
<td>5.00</td>
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<tr>
<td>Mining Geological &amp; Geophysical Eng</td>
<td>39</td>
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<td>6</td>
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<td>Natural Resources</td>
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<td>5.25</td>
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<td>Second Lang Acquisition &amp; Teaching</td>
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<td>18</td>
<td>34</td>
<td>5.00</td>
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<tr>
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<td>16</td>
<td>5</td>
<td>11</td>
<td>4.50</td>
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<td>Special Education</td>
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<td>4.50</td>
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<tr>
<td>Teaching &amp; Teacher Education</td>
<td>48</td>
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<td>27</td>
<td>6.50</td>
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</table>

**Arts and Humanities**

8-yr Completion Rates based on 3 entering cohorts: Academic Years 1996-1998

<table>
<thead>
<tr>
<th>Program</th>
<th>All</th>
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<th>Median Time to Degree</th>
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<tr>
<td>8-yr Completion Rate</td>
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</tbody>
</table>
Point-in-time (PIT) Reports
Use of Analytics

- Two broad purposes
  - Monitoring and managing enrollment & degree progress
    - Projecting matriculations, milestones, degrees awarded, etc.
  - Working with programs toward improvement
    - Having real data changes the conversation, especially with national comparisons like NRC
    - Programs usually want to know how they can improve a particular metric – an opportunity for best practice

- An in-house or central institutional research and analytics specialist is very useful
  - These are the metrics of your processes
Communication strategies

- Virtual chats/on line information
- Twitter
- Wiki use (resource for graduate coordinators)
- Face book (public and private)
- Graduate Catalog
- Virtual GLC
Website & more
Blogs

**Expectations for graduate study**

**Global Perspectives program**
Digital Signatures

Scheduling examinations
Voting
Submission of ETD

automatic fill-in, drop down menus & Email notifications
Virtual GLC

Main menu
- HOME
- CREATE ACCOUNT

Login
- FIRST NAME
- LAST NAME

Imprudence Viewer
- 1.4.0-beta-2 Windows
- 1.4.0-beta-2 Mac (Intel)
- 1.4.0-beta-2 Linux 32 bit / 64 bit
Users Timeline

US Internet users who use social networks sites, by age, in percentage of each group.

- **50-64 years**: 12\% in Sep 2005, 11\% in May 2008, 16\% in Nov 2008, 22\% in April 2009, 36\% in Dec 2009, 47\% in May 2010

Sources:
- www.simplicity.com/social-media/leaple-social-media/
- www.socialmedia-exchange.com/resources/how-hunt-growth/
- www.aliaslive.com
- www.pcmag.com
53% of employers research potential job candidates on social networks.

Over a third said a social networking profile proved they had lied about their qualifications on their CV.

13% claimed a potential employee had made discriminatory comments on their Facebook page.

9% said provocative or inappropriate photographs had been posted on the account.
During the average 20-minute period in 2010, there were:

- 5,870,000 wall posts
- 2,716,000 photos uploaded
- 10,208,000 comments posted

### Facebook 2010 - 2011 Growth

**Users accessing via their Mobile Device**
- 63M in 2010
- 200M in 2011 (Growth 200%)

**Pieces of Content Shared Weekly**
- 3.5B in 2010
- 7B in 2011 (Growth 100%)

**Registered Users**
- Growth 82% from 2010 to 2011
- 350% from 2010 to 2011
- 350% from 2010 to 2011

49% 49% of Twitter users either never or rarely check Twitter

Evolution
Million of registered users

Twitter 2010 - 2011 Growth

Registered Users
Growth 26% 2010: 75M, 2011: 95M

Tweets per Day
Growth 252% 2010: 27M, 2011: 95M

Users with a Biography
Growth 122% 2010: 31%, 2011: 69%
LinkedIn

Evolution
Million of registered users

<table>
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<tr>
<th>Year</th>
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<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
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</thead>
</table>

Registered Users

- Growth 138%
- 119M: 2011
- 50M: 2010
- 56% of them are from outside of the US

80% of companies use social media for recruitment

95% of them use LinkedIn
The World of Social Media

- USA: Facebook, Twitter, LinkedIn
- UK: Facebook, Twitter, LinkedIn
- Egypt: Facebook, Twitter
- Russia: Vkontakte, Odnoklassniki, Facebook
- Japan: Mixi, Twitter, Facebook
- China: QQ, Sina Weibo, Renren
- India: Facebook, Orkut, Twitter
- Brazil: Orkut, Facebook, Twitter
- South Africa: Facebook, Twitter, LinkedIn
- Australia: Facebook, Twitter, LinkedIn