CS197 Freshman Honor’s Seminar

Daniel G. Aliaga
aliaga@cs.purdue.edu

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Department of Computer Science
Purdue University
Why this seminar?

• Provide an overview of what research is, what research is occurring, and give you a peek at things you might be doing...
Who am I?

• Assistant Professor at Purdue
• Researcher/Post-Doc at Bell Labs/Princeton University
• Master’s & Ph.D. from UNC-Chapel Hill
• B.S. from Brown University (Honors)
• Born in Lima, Peru

• My research areas in Computer Graphics/Computer Vision:
  – Modeling and Visualization: genuinity detection, appearance editing, digital inspection
  – 3D Acquisition Methods: capturing, modeling, and rendering real-world 3D objects
  – Urban Modeling: dense 2D and 3D urban models, simulation, and visualization
Who are you?
Schedule

January 12  Organizational Meeting
January 19  Tour of Research Labs
January 26  Scholarship Opportunities and Career Paths
February 2  Research Areas in the Department
February 9  Research Presentation by Daniel G. Aliaga
            “Capturing, Modeling, and Rendering 3D Objects”
February 16 Research Presentation by Xavier Tricoche:
            “Scientific Visualization: Using Images to Understand and Solve
            Problems in Science, Engineering, and Medicine”
February 23 Research Presentation by Luo Si:
            “Information Retrieval”
March 2  Research Presentation TBA
March 9  Research Presentation TBA
March 23 Research Presentation by Mikhail Atallah:
            “Privacy Techniques for Collaborative Computing”
March 30 Paper Presentation (CS197 students)
April 6  Paper Presentation (CS197 students)
April 13 Paper Presentation (CS197 students)
April 20 Paper Presentation (CS197 students)
April 27 CS497 Demo Day (very tentative)
What is Research?

- Webster indicates:
  - Main Entry: **research**
    Pronunciation: ri-'s&rch, 'rE-
  - Function: **noun**
  - Etymology: Middle French *recherche*, from *rechercher* to investigate thoroughly, from Old French, from re- + *cerchier* to search
    1: careful or diligent search
    2: studious inquiry or examination; especially: investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories or laws in the light of new facts, or practical application of such new or revised theories or laws
    3: the collecting of information about a particular subject
What is Research?

• Computer Scientist as a Toolsmith
• Research is thorough
• Research vs. Programming
• Problem Statement
• Solution Statement
• Efficiency
• Guarantees
• Literature Search
• Research is fun!
Research Areas

• Traditional
  – Programming languages
  – Operating systems
  – Networking
  – Systems (graphics, databases, security, multimedia)
Research Areas

• Emerging
  – Databases and Data mining
  – Information security and assurance
  – Machine learning and information retrieval
  – Ubiquitous computing and networks
  – Bioinformatics/computational biology
    = medicine + computer science
  – Computational science
    = high-performance computers and challenging simulations
  – Computational arts and social computing
    = Social science + computer science
    = Archaeology + computer science (?)
  – Creativity
    = Psychology + computer science (?)

and many more...