

Elizabeth Ayers

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Education

Carnegie Mellon University

Ph.D. in Statistics
Predicting Performance and Creating Better Student Proficiency
Models by Improving Skill Codings
Advisor: Brian Junker
Committee: Ken Koedinger, Rebecca Nugent, Joel Greenhouse

Pittsburgh, PA
Anticipated Spring 2009

M.S. in Statistics

May 2005

Shippensburg University

B.S. in Mathematics, Summa Cum Laude
Minor: Economics

Shippensburg, PA
May 2003

Honors and Awards

CMU Graduate Student Assembly Conference Funds
Received a \$500 travel award from the Graduate Student Assembly
to cover expenses for conference travel.

March 2009

CMU Statistics Department Student of the Year Award
Awarded in conjunction with the American Statistical Association
Pittsburgh Chapter Annual Banquet

March 2009

Institute of Educational Sciences Graduate Fellowship
Carnegie Mellon Program for Interdisciplinary Educational
Research (PIER; pre-doctoral training program funded by the
Institute of Education Sciences (IES), U.S. Department of Education)
Tuition, monthly stipend, and travel funds.

Fall 2006-present

National Science Foundation Graduate Fellowship
Carnegie Mellon Vertical InteGration of Research and Education
(VIGRE; training and mentoring program funded by National
Science Foundation (NSF))
Tuition, monthly stipend, and travel funds.

Fall 2003-Summer 2006

Publications

Ayers, E., Nugent, R., and Dean, N. (Submitted). A Comparison of Student Skill
Knowledge.

Nugent, R., Ayers, E., and Dean, N. (Submitted). Conditional Subspace Clustering of Skill
Mastery: Identifying Skills that Separate Students.

Ayers, E., Nugent, R., and Dean, N. (Submitted). Conditional Subspace Clustering of Skill Mastery Information.

Ayers, E. and Junker, B. (2008). IRT Modeling of Tutor Performance To Predict End-of-year Exam Scores. *Educational and Psychological Measurement*, 68, 972-987.

Ayers, E., Nugent, R., and Dean, N. (2008). Skill Set Profile Clustering Based on Student Capability Vectors Computed From Online Tutoring Data. In Baker & Beck (Eds.). *Proceedings of the 1st International Conference on Education Data Mining*. pp.218-225. Montreal 2008.

Ayers, E., and Junker B. W. (2006). Do skills combine additively to predict task difficulty in eighth grade mathematics? In Beck, J., Aimeur, E., & Barnes, T. (Eds). *Educational Data Mining: Papers from the AAAI Workshop*. Menlo Park, CA: AAAI Press. pp. 14-20. Technical Report WS-06-05.

Technical Reports

Ayers, E. and Junker, B.W. (2007). *IRT Modeling of Tutor Performance To Predict End-of-year Exam Scores*. Technical Report 859, Department of Statistics, Carnegie Mellon University.

Presentations

Joint Statistical Meetings Upcoming, August 2009
Talk: *Conditional Subspace Clustering of Skill Mastery Information*

Joint Meetings of the Classification Society (of North America) and the Interface Society Upcoming, June 2009
Invited Talk: *Conditional Subspace Clustering of Skill Mastery*

Institute of Educational Science Research Conference Upcoming, June 2009
Poster: *Conditional Subspace Clustering of Skill Mastery Information*

Southern Society of General Internal Medicine Meetings February 2009
R Nugent, E Ayers, H Wang, M Phy, K Nugent. "Analysis of Content Mastery on the Internal Medicine In-Training Examinations". *Journal of Investigative Medicine*, Vol. 57, Abstract 414, 2009. (Research Presented; not a presenter.)

Educational Data Mining Conference June 2008
Poster: *Skill Set Profile Clustering Based on Student Capability Vectors*

Institute of Educational Sciences Research Conference June 2008
Poster: *Skill Set Profile Clustering Based on Weighted Student Responses*

Classification Society of North America Annual Meetings June 2008
Invited Talk: *Visualizing and Clustering Students' Skill Sets in a Unit Hyper-cube*

American Statistical Association, Pittsburgh Chapter Banquet March 2008
Poster: *Skill Set Profile Clustering Based on Weighted Student Responses*

Institute of Educational Sciences Research Conference June 2007
Poster: *IRT Modeling of On-line Tutor Performance to Predict End-of-Year Exam Scores*

American Statistical Association, Pittsburgh Chapter Banquet March 2007
Poster: *IRT Modeling of On-line Tutor Performance to Predict End-of-Year Exam Scores*

AAAI Educational Data Mining Workshop July 2006
Talk: *Predicting End-of-year Exam Scores: Do Skills Combine Additively to Predict Question Difficulty*

American Statistical Association, Pittsburgh Chapter Banquet April 2006
Poster: *MCAS Exam Prediction Models Using the On-line Assisment Tutor*

Professional Societies

American Educational Research Association (AERA)
Association for the Advancement of Artificial Intelligence (AAAI)
Classification Society of North America (CSNA)
Institute of Mathematical Sciences (IMS)
National Council on Measurement in Education (NCME)
Psychometric Society

Teaching Experience

Carnegie Mellon University

Instructor

Statistics Micro Mini class (HCI Masters Course) January 2008, 2009
Designed and taught intensive overview of statistics common to research in the field of Human Computer Interaction. January 2008: This class fulfilled a graduation requirement for nine registered HCI masters' students. In addition there were four graduate student auditors and three faculty auditors. January 2009: This class fulfilled a graduation requirement for nineteen registered HCI masters' students. In addition there were two graduate student auditors

36-201 Statistical Reasoning and Practice Summer 2004
Taught introductory statistics class for six undergraduates and two graduate student auditors in the College of Humanities and Social Sciences.

Teaching Assistant

36-201, Statistical Practice and Reasoning Fall 2008, 2003, Spring 2004
Held office hours, assisted students in lab (~35 per semester), graded homeworks and exams.

36-247, Statistics for Lab Sciences Spring 2008
Assisted 15 students in lab.

36-309, Experimental Design for Behavior & Social Sciences Fall 2007, 2005, 2004
Held office hours, assisted students in lab (~30 per semester),
graded homeworks.

36-705, Intermediate Statistics Fall 2006
Created homework solutions for graduate statistics class.

36-202, Statistical Methods Spring 2005
Associate Instructor. Created homework solutions and coordinated
grading among other TAs. Held office hours, assisted students in
lab (~30), and handled emails from students (~120).

Shippensburg University

Supplemental Instructor – Calculus II Spring 2002
Held bi-weekly review sessions and office hours for 30 students. Attended class to stay
current and be able to create notes for review sessions myself. Held extended sessions
to go over practice exams. Served as a liaison between the instructor and students.

Departmental and University Service

Carnegie Mellon University

Graduate Student Advisory Committee

Department Representative to Graduate Student Assembly

Shippensburg University

Mathematics Department Volunteer Tutor

Computer Languages and Applications

R, Splus, SPSS, Minitab, Microsoft Applications