# High School Teachers Workshop
# Fall 2013

Dr. Barbara G. Ryder
J. Byron Maupin Professor of Engineering
Head - Department of Computer Science
Virginia Tech

# CS - By the numbers

- 36 faculty (32 Bburg, 4 NCR; 5F:32M);
  - 10+ research scientists and postdocs, 2 senior instructors; 3 academic advisors
- AY2012-13 grads: 128 BS, 35 MS, 33 PhD (24%F)
- In the pipeline: ~550 CS majors, 167 PhD students, 61 MS students
- FY13:
  - ~$11M in research expenditures
  - $8.2M in new grant funding
  - FY14 started with ~$34M in total research funding
- 85+ industrial partner companies in CSRC

# Recent Department Honors

- Named by Wall Street Journal recruiters' poll as #5 CS Dept in US to recruit from (Fall 2010)
  - More polls since citing CS@VT among top 10 CS depts in ROI for our CS BS degree
- Cited by NSF as top 30 program in CS PhD production
  - 18.6 per academic year since 2008-2009
- Six NSF/DOE CAREER Awards to faculty since 2008!
- CS undergrad selected to represent VT at National Conf on Undergrad Research, 2013 Meeting of the Minds Conf
- CS grad student winner of 2013 GTA Excellence Award from Graduate School
- 2013 Virginia Outstanding Faculty Awardee: Dr. Steve Edwards

# New CS Faculty in 2013-2014

Aditya Prakash CMU
"Big data" analytics
Joined January 2013

Manish Jain USC
Artificial intelligence
To join January 2014

Changhee Jung GaTech
PL/Compilers
Joined August 2013

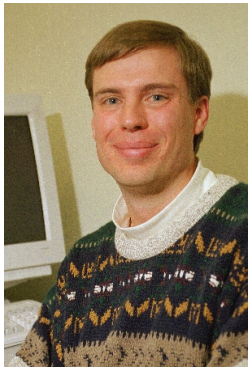
Dongyoon Lee UMich
Run-time systems
To join January 2014

# NSF CAREER Award winners

Kirk Cameron*
Power-Aware Systems,
+ DOE Career Award

Manuel Perez*
Dialog Management

Wenjing Lou*
Cyber security



Doug Bowman*
Virtual Environments

Adrian Sandu*
Computational Science

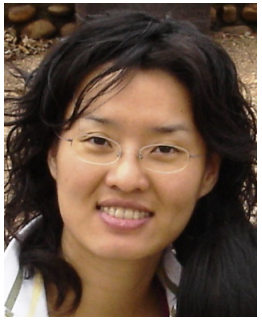
Naren Ramakrishnan*
Recommender Systems

Ali Butt*
Storage Systems

Anil Vullikanti*
Cognitive Radio
Networks + DOE
Career Award

Godmar Back*
Runtime Models for
Cloud Computing

Yang Cao*
Simulation of Complex
Biochem. Systs



Daphne Yao
Malware
Detection

# Recent Faculty Honors

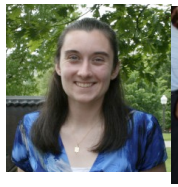
- Naren Ramakrishnan, Thomas L. Phillips Professor of Engineering (2012)
- Wu Feng, Elizabeth and James Turner '56 Faculty Fellow (2012)
- Stephen Edwards, W.S. "Pete" White Chair for Innovation in Engineering Education, (2012-2014)

# CSRC – Industrial partners

- 85+ member companies
- Visit twice a year to hold Career Fairs
- Provide $$ support for scholarships and student co-curricular activities
- Provide internship experiences

# Selection of undergrad student honors

- CS students Luke Marrs, Scott Fernandez, James McIntyre, and Joe Liversedge all winners of the design competition for the VT Arlington Research Center (2013)
- CS undergrad Elena Nadolinski, a national winner in the NCWIT Aspirations in Computing Award competition (2011), was one of six NCWIT winners who was honored at the White House as part of the CS Education Week (2012)
- Association of Women in Computing (AWC) President Ariel Cohen and fellow AWC members received an NCWIT Student Group Seed Grant for their mentoring program (2012)
- Eeshan Shah (2011), Jacqueline Adessa(2009), Gabriel Martinez(2009) Honorable Mention in CRA Undergraduate Research Competition; Adessa (2010) CRA URC finalist
- Jenny Kammer (2009), Aaron Lindsay (2010), J.D. Ryding (2011) VT C.T. Tate Senior Co-op Awards



# How Undergrads Explore CS@VT

- Opportunities to
  - Talk to famous computer scientists coming for Distinguished Lectures
    - CS & ECE women students and faculty gather for dinner with DLS speaker at Ryder home each year
  - Participate as undergrad researcher in state-of the art CS research
  - Explore interdisciplinary studies through our CS minors
  - Become an undergrad Teaching Assistant
  - Find internships and jobs
  - Attend Grace Hopper Celebration of Women in Computing and/or Tapia Celebration of Diversity in Computing
  - Meet informally with faculty during office hours
  - Participate in our several co-curricular organizations

# Co-curricular Activities

- VTURCS
- AWC
- CS^2
- ACM Student Chapter
- UPE
- VT Gaming project
- + Clubs on mobile devices and cyber security

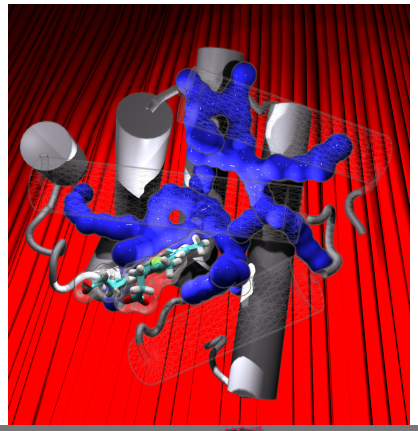
Women in Computing Day

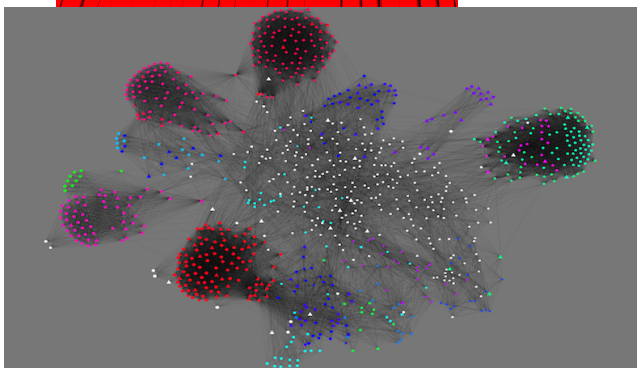
Phi Beta Kappa

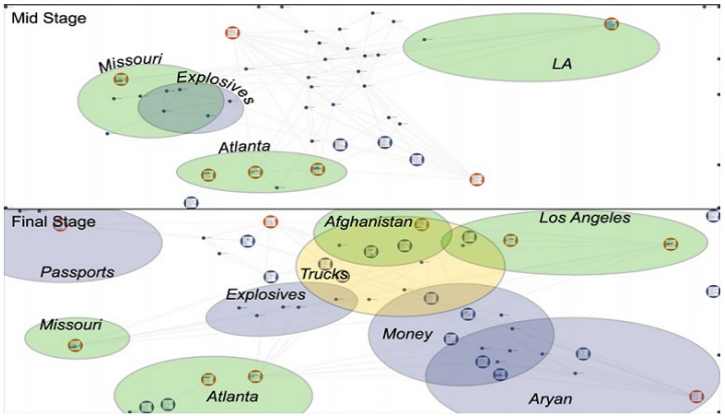
UPE Induction - 2009

Grace Hopper 2008

# Examples of CS@VT Research







# CS Education Initiatives

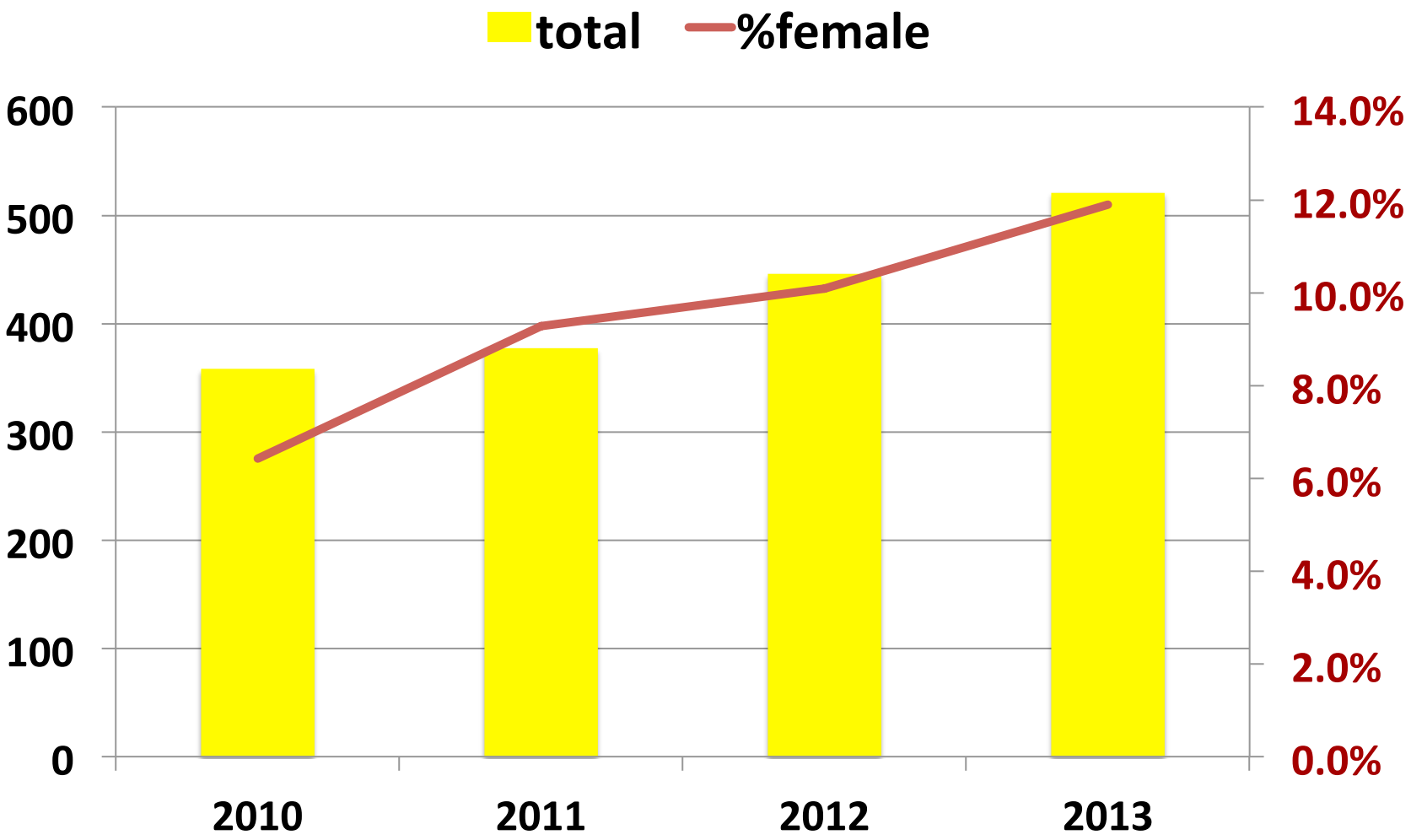
- Teaching CS beginners good SE practices
- Partnering with K-12 on new College Board CS Principles course
- Exploring new pedagogies to engage more diverse students in CS studies
- Developing course(s) in computational thinking

# Recent Data on Diversity from NCWIT

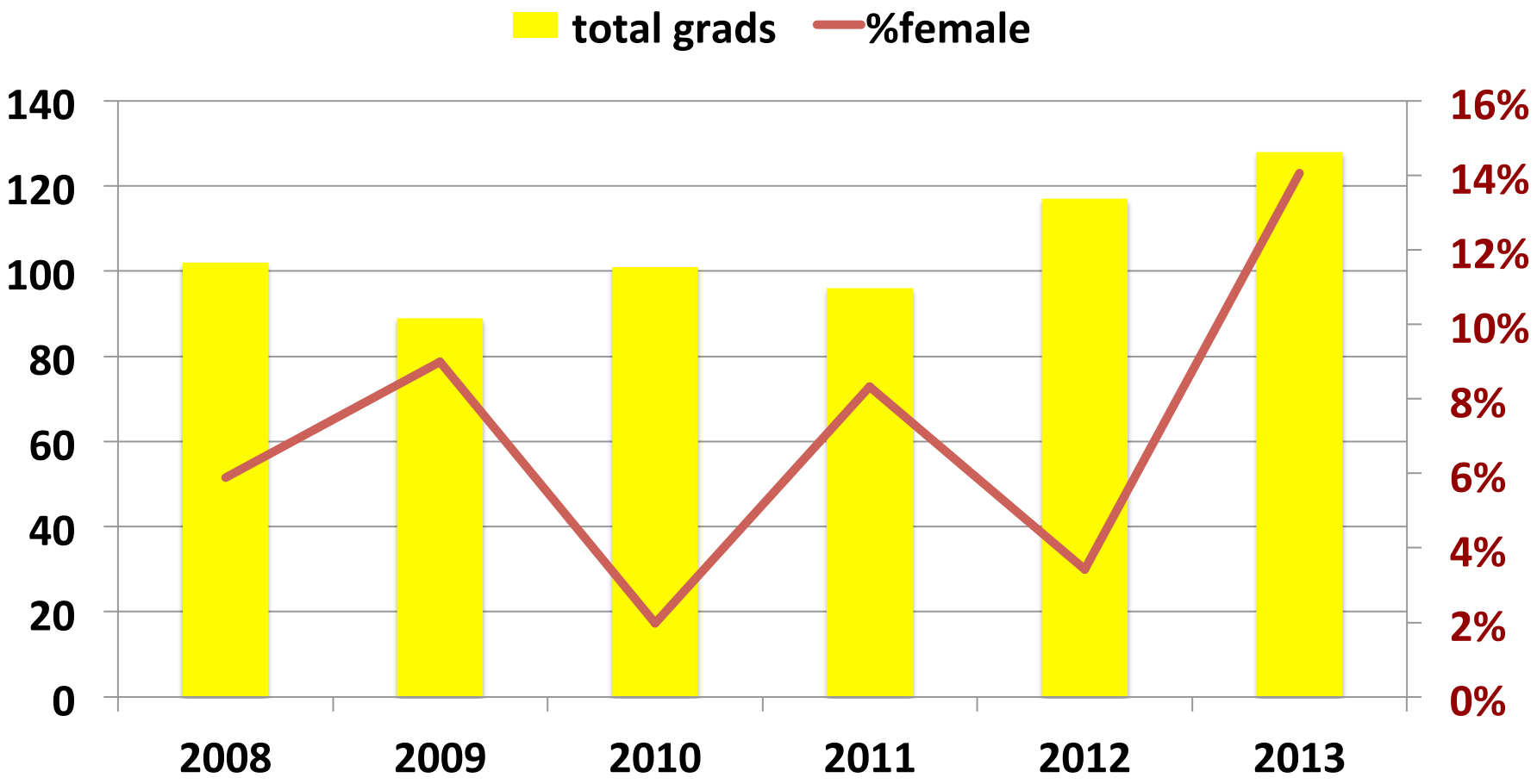
- 19% of AP CS exam takers are women
- 18% of CIS degrees are women
- Technical women leave the workforce at twice the rate of men (58%)
- Women hold 25% of US technology jobs, 19% software developer jobs, but only 5% of technology leadership jobs
- WHAT CAN WE DO ABOUT THIS SITUATION?

# CS Majors – CS@VT

## 12% women in CS meets national average



# Graduation Totals - CS@VT

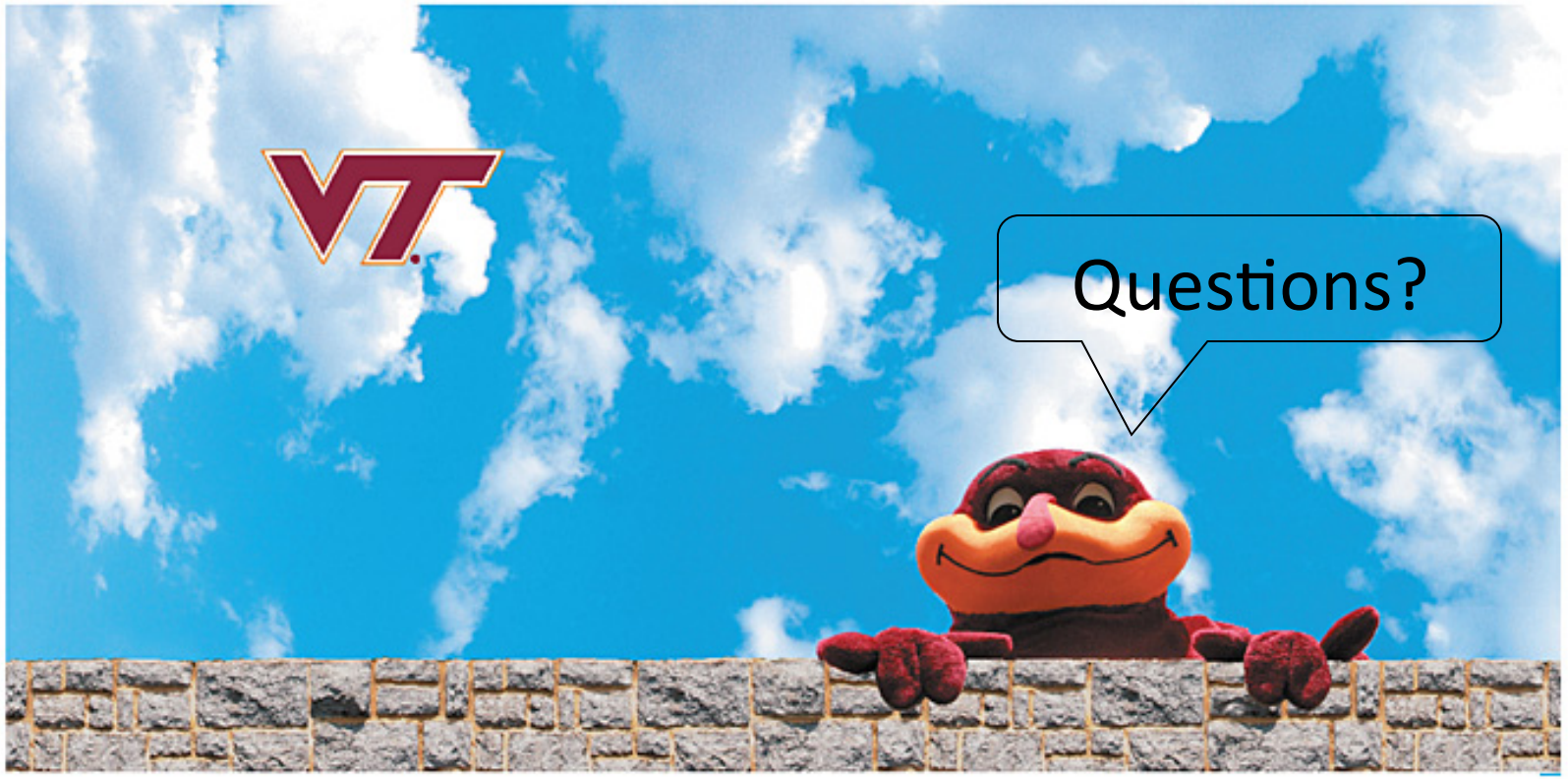


# CS@VT Diversity Initiatives

- HS visits by CS undergrads & faculty/advisors to attract underrepresented students to CS@VT
- Presentations to attract first year COE students
  - In Hypatia and Galileo engineering dorms
  - In pre-frosh summer STEP program
  - In COE summer workshops for HS women
- Membership in NCWIT
  - Pacesetters to attract 'net new women' to CS
  - Leadership in VA/DC Aspirations in Computing awards
    - 6 new women CS majors are NCWIT Aspirations national/regional award winners
- Annual sponsorship of Grace Hopper Celebration of Women in Computing and Tapia Conference on Diversity in Computing w. student attendees
- Annual HS teachers' workshops with CS@VT faculty (funded by NCWIT, Microsoft, Google)

# CS@VT & NCWIT

- Pacesetters
  - (www.ncwit.org/programs-campaigns/pacesetters)
  - Campaign to increase number of net new women at universities and in industry
  - Sit With Me campaign
- VA/DC Aspirations in Computing Awards
  - www.aspirations.org
  - Targeting high school women, adding a middle school program
  - 6 NCWIT regional/national Aspirations award winners in CS@VT now
- NSF Engage grant
  - Working together to recruit more women into CS and ECE majors


Questions?