Why Grad School Workshop

Mubarak Shah
Center for Research in Computer vision
University of Central Florida
July 25, 2024
Agenda: July 25, 2024, HEC 119

• 1:00 PM Why Graduate School? Dr. Shah
  • Some Thoughts on Graduate School,
  • Corey McCall, 2011 NSF Fellowship winner
  • Enrique Ortiz, 2007 NSF Fellowship Winner

• 2:00 -2:30 PM UCF CS Graduate Programs: Professor Wei Zhang

• 2:30 -3:00 PM Angelina Leary, NSF Fellowship Winner

• 3:00 -3:30 PM Nyle Siddiqui, CRCV Ph.D. student

• 3:30-4:00 PM Jennifer Parham Sr. Assistant Dean College of Graduate Studies

• 4:00-4:30 PM Joseph Fiorese, CRCV Ph.D. student

• 4:30-5:00PM Discussion
Why Graduate School?

• Job after B.S.
  • Mostly programming
  • Routine, boring..
  • Not much chance for growth
  • Low salary

• Job after Ph.D.
  • Thinking, leadership
  • Challenging, hard
  • Large salary, security of job
  • Lots of chances for growth
Job After Ph.D.

• Industry
• Academic
• National Labs
• Startups
Non-Academic Jobs

• National Labs
  • ARL, AFRL, NRL, PNNL, Oak Ridge Lab, JPL, Ames, Lawrence Livermore National Laboratory....

• Industry
  • Commercial
    • Google, Microsoft, Facebook, Amazon, IBM,..
  • Defense Contractors
    • Lockheed, Harris, Northrop Grumman, Raytheon, General Dynamics
  • Startups
University Professorship

• Assistant Professor
• Associate Professor
• Full Professor

• Eminent Scholar/Named Chair Professor
Agere Chair
Expectation/Duties of a University Professor

• Teach
• Supervise Ph.D., M.S., B.S. students
• Secure funding/write proposals
• Publish papers
• Provide service to the research community
• Be the leader in the field
Evaluation of a Professor

- Student evaluations of teaching
- Citations, h-index
- Number of Ph.D. graduates
- Dollar amount of funding
- Awards
  - Fellow of Professional Societies, best paper awards
- Recommendation Letters
- Keynotes/Invited talks, short courses
- Professional Service to the community
  - Associate Editor of A journal
  - Program/General Chair of a conference
Citations: Impact of your work

- Total Number of Citations
- H-index
- Impact Factors of Journals and Conferences

- [http://scholar.google.com/](http://scholar.google.com/)
<table>
<thead>
<tr>
<th>TITLE</th>
<th>CITED BY</th>
<th>YEAR</th>
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<tbody>
<tr>
<td>Object tracking: A survey</td>
<td>7389</td>
<td>2006</td>
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<tr>
<td>A Yilmaz, O Javed, M Shah</td>
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<tr>
<td>Acm computing surveys (CSUR) 38 (4), 13-es</td>
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<td>UCF101: A dataset of 101 human actions classes from videos in the wild</td>
<td>6519</td>
<td>2012</td>
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<tr>
<td>K Soomro, AR Zamir, M Shah</td>
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<tr>
<td>arXiv preprint arXiv:1212.0402</td>
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<td>Shape-from-shading: a survey</td>
<td>2264</td>
<td>1999</td>
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<tr>
<td>R Zhang, PS Tsai, JE Cryer, M Shah</td>
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<tr>
<td>IEEE transactions on pattern analysis and machine intelligence 21 (8), 690-706</td>
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<td>Transformers in vision: A survey</td>
<td>2256</td>
<td>2022</td>
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<td>S Khan, M Naseer, M Hayat, SW Zamir, FS Khan, M Shah</td>
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<tr>
<td>ACM computing surveys (CSUR) 54 (10s), 1-41</td>
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<tr>
<td>Abnormal crowd behavior detection using social force model</td>
<td>2225</td>
<td>2009</td>
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<tr>
<td>R Mehran, A Oyama, M Shah</td>
<td></td>
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<tr>
<td>2009 IEEE conference on computer vision and pattern recognition, 935-942</td>
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Papers

• You need papers
  • To graduate
  • To get a job
  • To get a promotion
  • To get awards
Components of A Research Paper

• Title
• Abstract
• Introduction
• Rest of the Paper
Components of A Research Paper

• Title
• Abstract

• Introduction
  • What is the problem?
  • Motivation, why it is important?
  • What is the state of art?
  • What is your approach?
  • Why it is great?

• Related Work
• Approach
  • Detailed Method, different steps
  • Results
• Conclusion
• References
What are good papers?

• Easy to follow
• Simple to implement
• High Impact
  • Citations, h-index
Paper Review Process: Journal

• Submit, no deadline
• Assigned to an Associate Editor (AE)
• AE assigns to reviewers
• Single Blind reviewers
• AE makes a decision: Reject, Minor revision, major revision
• Revise the paper, and resubmit
• Decision
• Submit final version
Paper Review Process: Conference

- Submit on fixed deadline
- Assigned to an Area Chair (AC)
- AC assigns to reviewers
- Double Blind review
- Rebuttal
- ACs meet physically
- Two ACs makes a decision: Reject; accept as a poster or oral
- Submit final version
- Present it in the conference
Paper Review Process: Conference

- Paper
- Supplementary Material
- Reviews
- Rebuttal
- Meta Review
- Camera Ready
Computer Vision Journals
INTERNATIONAL JOURNAL OF COMPUTER VISION

Now Accepting Video Submissions

Editors:

Chater Feugrose

Katsushi Ikeuchi

Kazuo Otani

Jean-Pierre Froehlich

Korean Academic Publishers

UCV Website: http://www.ucv.ucv.co.uk
Computer Vision Conferences
NeurIPS 2024
Other Conferences

• AAAI
• IJCAI
• ICRA
• IROS
Impact Factors of Journals and Conferences
<table>
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<tr>
<th>Publication</th>
<th>h5-index</th>
<th>h5-median</th>
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<tr>
<td>1. Nature</td>
<td>488</td>
<td>745</td>
</tr>
<tr>
<td>2. IEEE/CVF Conference on Computer Vision and Pattern Recognition</td>
<td>440</td>
<td>689</td>
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<tr>
<td>3. The New England Journal of Medicine</td>
<td>434</td>
<td>897</td>
</tr>
<tr>
<td>4. Science</td>
<td>409</td>
<td>633</td>
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<tr>
<td>5. Nature Communications</td>
<td>375</td>
<td>492</td>
</tr>
<tr>
<td>6. The Lancet</td>
<td>368</td>
<td>678</td>
</tr>
<tr>
<td>8. Advanced Materials</td>
<td>327</td>
<td>420</td>
</tr>
<tr>
<td>9. Cell</td>
<td>320</td>
<td>482</td>
</tr>
<tr>
<td>10. International Conference on Learning Representations</td>
<td>304</td>
<td>584</td>
</tr>
<tr>
<td>11. JAMA</td>
<td>298</td>
<td>498</td>
</tr>
<tr>
<td>13. IEEE/CVF International Conference on Computer Vision</td>
<td>291</td>
<td>484</td>
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Demand for Candidates with Computer Vision/Machine Learning Ph.D. have been high
Google Offer for one of my students (2015)

- $135,000 Salary
- $30,000 Sign in bonus
- 230 Google Stocks
- 15% yearly bonus (minimum)
Facebook offer of Fresh Ph.D. from USC (2016)

• Total package for one year: $280K
  • The first day on her job she received a check of $100K!
  • She bought a mini Cooper!
Salaries of our Ph.D. graduates

• One of my students was hired at $300K+ salary by Apple (2017)
• Another of my students was hired at $350K+ salary by Netflix (2018)
• Another of my students was hired at $400K+ salary by Netflix (2019)
• Another of my students was hired at $385K salary at Amazon (2023), this month he accepted a job at Adobe at $500K (2024)
• Rumor is one of my former students is making $1.2 million per year at Amazon
• Rumor is one of my former students is making $2 million per year at Meta
Recently Hired Assistant Professors at UCF

- 2017
  - $136,000 yearly Salary
  - $210,000 start up
- 2018
  - 200K yearly salary
  - $100,000 start up
- 2019
  - $136,000 yearly Salary
  - $210,000 start up
- 2021
  - $160,000 yearly Salary
  - $260,000 start up
Some of our Ph.D. Graduates
Matías Andrés Mendieta

2016-2019  B.S., University of North Carolina at Charlotte
2019-2020  M.S., University of North Carolina at Charlotte
2020-2021  Ph.D. student, University of North Carolina at Charlotte
2022       Applied Scientist Intern, Amazon
2023       Machine Learning Intern, Apple
2021-2024  Ph.D., University of Central Florida
2024       Apple
My time at CRCV helped me grow as a person not only by challenging me and pushing me beyond my limits but also by making me resilient, teaching me how to navigate and learn from failures repeatedly. I will forever cherish the memories of countless late-night discussions that ranged from academic topics to life's intricacies, leading to lasting friendships. To everyone who has been a part of this incredible journey, thank you.

Mamshad Nayeem Rizve
Ph.D. Graduate, Summer 2023
Postdoctoral Scientist, Amazon
Being part of CRCV has been nothing short of life changing, not only academically but also personally. During these years, I have had the privilege of working alongside some of the most brilliant minds, mentors who have guided me with unwavering patience and peers who have become friends for life. As I bid farewell to this remarkable chapter, I carry with me the lessons learned, the skills acquired, and the cherished memories made. With heartfelt gratitude, I thank every individual who has been a part of my life here.

I am happy to share that I have joined Qualcomm in San Diego.

Aayush Rana
Ph.D. Graduate, Summer 2023
I transferred to CRCV with my advisor in the middle of my PhD study, and it has been a transformative journey since then. I feel fortunate to work with a group of faculty members with profound expertise, dedication, and unwavering support. The guidance and mentorship I received have pushed me to explore new boundaries, to question established norms, and to think critically. What makes CRCV even more remarkable is the company of my fellow students. As I prepare to graduate, I feel excited to embark on the next chapter of my journey, confident in the foundation that CRCV has provided me.

Thank you for your congratulations. I will be joining AWS AI Labs.

Taojiannan Yan
Ph.D. Graduate, Summer 2023
Kevin Duarte · 1st
Machine Learning Engineer at Adobe
Adobe · University of Central Florida
Mahdi M. Kalayeh (He/Him) · 1st
Senior Research Scientist at Netflix
San Francisco Bay Area · Contact info

500+ connections

Ulaş Bağcı, Aidean Sharghi, and 94 other mutual connections

Netflix

2019 Ph.D.
Afshin Dehghan, PhD · 1st
Sr AI/ML Manager ð, Hiring Experts in Multimodal Foundation Models
San Francisco Bay Area · Contact info
Apple
Nasim Souly, PhD  (She/Her) · 1st
Applied Scientist II at Amazon Fashion, Gen AI
Virtual Try On
Amazon · University of Central Florida
San Francisco, California, United States · Contact info
500+ connections
Amir Zamir
Researcher

EPFL
https://vilab.epfl.ch/zamir

Amir Zamir @ Swiss Federal Institute of Technology EPFL
My research interests are broadly in computer vision, machine learning, and AI. The goal of my research has been going beyond narrow and passive vision methods...
Ramin Mehran (He/Him) · 1st
Tech Lead @ Google AI, Multi-Modal perception/generation, AI Breakdown Podcaster

Google · University of Central Florida
Bellevue, Washington, United States · Contact info

2,040 followers · 500+ connections
Asaad Hakeem (He/Him) · 1st

Applying AI in Health Tech to improve the human condition
San Francisco, California, United States · Contact info

3,121 followers · 500+ connections

Amir Zamir, Michael J. G. McLaughlin, and 55 other mutual connections

Stanford University

2007 Ph.D.
Empowering The Healthcare Revolution With AI Technologies

Cloud Based Enterprise PACS & Patient Data Solution

View Services
Omar Javed
San Francisco Bay Area · Contact Info
2K followers · 500+ connections

Join to view profile · Message
Create hyper-personalized product demos, at scale.

Leadership

Fahad Aziz
Founder and CEO

Omar Javed
Co-Founder and CTO

Andrew NG
Investor

Pierce Gaynor
Head of Product

Jon Miller
Board Member
Alper Yilmaz

Professor, Civil Environmental and Geodetic Engineering
Professor, Computer Science and Engineering
Boltz Hall
2036 Neil Ave Mall
Columbus, OH 43210-1226
(614) 247-4323
yilmaz.15@osu.edu

I Biography

Dr. Yilmaz is Professor with appointments in Civil Environmental and Geodetic Engineering and Computer Science and Engineering (courtesy) Departments at The Ohio State University. He has been inducted to the U.S. National Academy of Inventors in 2020, is a Fellow of the American Society for Photogrammetry and Remote Sensing (ASPRS) and is a senior member of IEEE. Dr. Yilmaz is currently interim president for the ISPRS Technical Commission II. He is serving as Editor-In-Chief for the Photogrammetric Engineering and Remote Sensing Journal (PE&RS). During his leadership of the PE&RS journal, the impact factor has increased to its highest since its first volume in 1934. In 2019, PE&RS was ranked 19th most downloaded journal among all 11,000 titles on Ingenta Connect Platform. He has served as Associate Editor for the Computer Vision and Image Understanding Journal between 2014 and 2016 and the Machine Vision and Applications Journal between 2006 and 2011.

Based on a recent study from Stanford University and Elsevier (published on October 19, 2021), Dr. Yilmaz is listed among the top 2% most cited researchers in the fields of “Artificial Intelligence & Image Processing” and “Geological & Geomatics

2004 Ph.D.
Zeeshan Rasheed · 1st
Chief Technology Officer
Great Falls, Virginia, United States · Contact info
500+ connections

Michael J. G. McLaughlin, Harpreet Sawhney, and 25 other mutual connections

Novateur Research Solutions
University of Central Florida

2003 Ph.D.
Alvaro Velasquez · 1st
Program Manager at Defense Advanced Research Projects Agency (DARPA)

Defense Advanced Research Projects Agency (DARPA) ·
University of Central Florida

Washington, District of Columbia, United States ·

2013 REU
Biography

I am a Senior Research Scientist at Google DeepMind where I work on generative modeling, self-supervised learning and multimodal learning in the video domain. I am interested in effectively incorporating the time dimension to learn more general representations towards the goal of compositional generalization. I received my PhD from the Computer Science & Engineering Department at the University of Michigan, Ann Arbor under the supervision of Professor Honglak Lee. During my PhD, I mainly focused on building models for future frame prediction using self-supervised and supervised approaches. I also contributed to building world models successfully applied in model-based reinforcement learning.

Fun Facts: I played for my national basketball team (I am originally from Ecuador). I was also second best scorer in the nation in a national championship I played back in the day. I was part of a team that beat the media's projected champion during a championship in Quito (the guy that was best scorer in the national championship played for the other team :P). Let's have a Curry-range 3-point shootout. Ok, I'll stop now ...

2012 REU
Agenda

• Why should you consider Graduate School?
• Corey McCall, 2011 NSF Fellowship winner
• Enrique Ortiz, 2007 NSF Fellowship Winner
Some Thoughts on Graduate School

Corey McCall
2011 NSF Fellowship Winner from UCF, was admitted to Stanford
Agenda

• Why?
• How do I get in?
• Resources
Thoughts on Graduate School

Why?

“The Ph.D. is a tremendous opportunity. You get to pick an advisor in any research area you like and then you get to do research in that area, receive mentoring, think deeply on problems, publish papers, become famous, while paying zero tuition for 6 years and receiving a salary”

-Harchol-Balte (CMU CS)

*He forgot to mention travel!
Dr. Shah’s Travel (2019)

- January, Waikoloa Village, Hawaii, WACV
- March, Oslo, Norway, Distinguished Speaker
- June, Long Beach, CA, CVPR
- September, Taipei, Taiwan, Keynote Speaker
- September, London, UK, BMVA, Invited Talk
- October, Nice, France, ACM MM, Technical Achievement Award
- October, Soul Korea, ICCV
- October, Aman, Jordon, Keynote Talk
- November, Houston, Invited Talk
- November, Tampa, Invited Talk
- December, Abu Dhabi, UAE, Invited Talk
- December, Perth Australia, Keynote Talk
Thoughts on Graduate School

Why?

• Character traits of a potential graduate student
  • You love to discover through research
  • You connect well with your professors
  • You love to teach others
  • You don’t care if the problem doesn’t have a solution.
  • Graduation...already?

• Character traits of a potential industry worker
  • You are eager to redeem your degree for a good job
  • You simply enjoy “coding.”
  • You are burnt out

PUZZLER: find the grad student!
Thoughts on Graduate School

Why?

“No mom, not that kind of doctor…”

• Engineering Graduate School is not like Med/Law/MBA school.
  • Emphasis on discovery (research), not learning (class)
  • Grad students typically get paid tuition and an adequate living stipend

“They are smart, but naïve; you have to be careful not to tell them that the things we are expecting them to do are impossible.”

-Matt Manson (CMU RI)
Thoughts on Graduate School

How do I get in?

What’s important?

- **Research**
  - Statement of Purpose/“Fit”
  - GPA
  - Letters of Recommendation
  - Teaching or work experience
  - GRE scores

Where do I apply?

- Start with U.S. News rankings, then browse lab websites
- Ask your advisor
- The best schools do not have the lowest acceptance ratios!!

When do I start?

- Start preparing the summer before

How many schools?

- As many as you have time for. Do not rush the applications!
Thoughts on Graduate School

How do I get in?

A word on fellowships... APPLY FOR THEM

• Fellowships are your golden ticket into a top-ranked school. If you are at all qualified, you are more attractive than the next student that will cost them ~$40K/year more.

• If you win, schools that rejected/waitlisted you will call you back (they called me)!

• The NSF GRFP is available to all U.S. Citizens, is worth over $121K, and has an acceptance rate of almost 20%.
Thoughts on Graduate School

How do I get in?

How did I get in?
• Thesis, 2 conference presentations, and 2 first-author papers
• Teaching and Leadership Experience
• Letters from research advisors
• Average GPA and below average GRE
• *NSF Fellowship*

Where did I apply?
• GA Tech (31%)
• UCF (30%)
• CMU ECE (29%)
• Stanford (28%)
• NSF GRFP (18%)
• NDSEG (10%)
• CMU RI (<10%)
Applying for Fellowships

By Enrique G. Ortiz
Tips

• Find a fellowship buddy
• Make time
• Do your homework
• Visit university fellowship office
• Narrow your focus
• Know your audience
• Recommendations
Find a Fellowship Buddy
Make Time

• START EARLY

• Make schedule – Calendar, Spreadsheet, Etc.

• Just write
Do Your Homework

• Find all fellowships you are eligible for
• Note all of their requirements
• Find out what exactly they are looking for

• NSF Graduate Research Fellowship
  • Intellectual Merit
  • Broader Impacts
  • 3 Essays: Previous Research, Personal Statement, and Research Proposal
Visit University Fellowship Office

• MOST important resource
• They have:
  • Experience
  • Previous Submissions
  • Resources
Narrow Your Focus

• Find a project/area to focus on
• Not necessarily what you will work on
• Check existing literature
• Make sure you have a hypothesis
Know Your Audience

• Write clearly
• Reader isn’t expert in field
• Format appropriately
• Use figures and graphics where appropriate
Recommendations

• START EARLY
• Have a backup
If you don’t get it the first time... try next year!!!
How to Apply for Graduate School

• Take GRE
• Get good Recommendation letters
• Write Statement of Purpose
• Contact potential advisors and read their papers
• Apply for fellowships
• Publish papers
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• 1:00 PM  Why Graduate School? Dr. Shah
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  • Enrique Ortiz, 2007 NSF Fellowship Winner
  • List of fellowships