

VINEET PANDEY

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My research advances the design of social computing systems by integrating learning and collaboration among experts and communities to enable complex work such as generating and evaluating scientific theories. My research systems have been deployed in the wild with people with rare neurological disorders (like ataxia-telangiectasia), the American Gut Project (world's largest crowdfunded citizen science project), Open Humans biohackers, and more. Over 600 people from 30 countries have self-organized to generate theories about the human microbiome and test them by running experiments.

Here's a short NPR interview about my research: <http://bit.ly/npr-ucsd-gut-instinct>

EDUCATION

Harvard University
Nov 2019-

Postdoctoral Fellow, Intelligent and Interactive Systems Group
Associate, Center for Research on Computation and Society
Non-Employee Researcher, Mass General Hospital
Mentors: Krzysztof Gajos (Computer Science, Harvard) &
Dr. Anoopum Gupta (Neurology, Harvard Medical School)

UC San Diego
2019

Ph.D., Computer Science & Engineering
Thesis: *Citizen-led Work using Social Computing and Procedural Guidance*
Committee: **Scott Klemmer**, Don Norman, Jim Hollan, Rob Knight, Laurel Riek
2019 Jacobs School of Engineering Henry Booker Award for Exemplary Ethical Engineering

2017

Masters (Systems concentration), Computer Science & Engineering
Exam Title: *Scaling Learner Feedback*
Committee: Scott Baden, Sorin Lerner, Bill Griswold
Perfect score; Synthesis paper + talk considered a model

BITS Pilani, India
2011

Bachelor of Engineering (Honors), Computer Science
Thesis: *Integer Representations towards Efficient Counting in the Bit Probe Model*
Mentor: Srinivasa S. Rao (Seoul National University)

PUBLICATIONS

Google H-Index: 8. In HCI, student authors are generally listed first; supervising faculty generally listed last. The premier HCI publication venues are the annual ACM CHI, UIST, & CSCW conferences.

- 1 **Galileo: Citizen-led Experimentation using a Social Computing System** Vineet Pandey, Tushar Koul, Chen Yang, Mad Price Ball, Bastian Greshake Tzovaras, Daniel McDonald, Rob Knight, Scott Klemmer *ACM CHI 2021*
Taught at USC (*CSCI 499: Computing for Social Good*)
- 2 **From novices to co-pilots: Fixing the limits on scientific knowledge production by accessing or building expertise** Vineet Pandey, Anoopum Gupta, Krzysztof Gajos *LIMITS 2020*
- 3 **American gut: an open platform for citizen science microbiome research** Daniel McDonald, Rob Knight, Vineet Pandey, Scott Klemmer, American Gut Consortium *American Society for Microbiology mSystems 2018*
- 4 **Docent: Transforming Personal Intuitions to Scientific Hypotheses through Content Learning and Process Training**
Vineet Pandey, Justine Debelius, Embriette Hyde, Tomasz Kosciolk, Rob Knight, Scott Klemmer · *ACM Learning@Scale 2018*
- 5 **Gut Instinct: Creating Scientific Theories with Online Learners**
Vineet Pandey, Amnon Amir, Justine Debelius, Embriette Hyde, Tomasz Kosciolk, Rob Knight, Scott Klemmer · *ACM CHI 2017*

- 6 **Framing Feedback: Choosing Review Environment Features that Support High Quality Peer Assessment**
Catherine Hicks, Vineet Pandey, Ailie Fraser, Scott Klemmer · *ACM CHI 2016*
Taught at CMU (05-499A / 05-899A: *Designing large-scale (peer) learning systems*) and Northwestern (EECS 497: *Peer Grading*)
- 7 **Concerto: A High Concurrency Key-Value Store with Integrity**
Arvind Arasu, Ken Eguro, Raghav Kaushik, Donald Kossmann, Pingfan Meng, Vineet Pandey, Ravi R. · *ACM SIGMOD 2017*
- 8 **An HCI View of Configuration Problems**
Tianyin Xu, Vineet Pandey, Scott Klemmer · *arXiv*
- 9 **Integer Representations towards Efficient Counting in the Bit Probe Model** Gerth S. Brodal, Mark Greve, Vineet Pandey, S. Srinivasa Rao. *Journal of Discrete Algorithms 2014, TAMC 11*

EXTENDED ABSTRACTS

- 1 **Citizen Microbiology: Moving Beyond Crowdsourcing to Active, Participatory Science by the Public** · Vineet Pandey, Scott Klemmer, Daniel McDonald, Rob Knight · *American Society of Microbiology 2019*
- 2 **Improving Health Outcomes by Integrating Personal Knowledge, Community, and Data** · Vineet Pandey · *ACM CHI 2019 Workshop: Body As Starting Point*
- 3 **Reconstruction Reduces Fixation on Surface Details of Explanations** · Sam Lau, Tricia Ngoon, Vineet Pandey, Scott Klemmer · *ACM Creativity and Cognition 2019*
- 4 **Gut Instinct: Creating Scientific Theories with Online Communities** · Vineet Pandey · *CSCW Doctoral Consortium 2018*
- 5 **Transitioning the American Gut Project to the Microsetta Initiative** · Daniel McDonald, Alexander Aksenov, Alexey Melnik, Pieter Dorrestein, Larry Smarr, Rashmi Sinha, Vineet Pandey, Scott Klemmer, Rob Knight · *American Society of Microbiology 2018*
- 6 **Integrating Citizen Science with Online Learning to Ask Better Questions** · Vineet Pandey, Scott Klemmer, Amnon Amir, Justine Debelius, Embriette Hyde, Tomasz Kosciolk, Rob Knight · *HCOMP 2016*
- 7 **Game-Theoretic Models Identify Useful Principles for Peer Collaboration in Online Learning Platforms** · Vineet Pandey, Krishnendu Chatterjee · *CSCW 2016*
- 8 **Education Across Borders: Technology Supported Mentoring and Teambuilding.** · Vineet Pandey · *HCI Across Borders, CHI 2016 Workshop*
- 10 **Connecting Stories and Pedagogy Increases Participant Engagement in Discussions** · Vineet Pandey, Y. Kotturi, C. Kulkarni, M. Bernstein, S. Klemmer · *Learning@Scale 2015*
- 11 **Analysis of Tree Indexing Structures for Flash Memory** · SeungBum Jo, Vineet Pandey, S. Srinivasa Rao · *Student Symposium, 18th International Conference on High Performance Computing, 2011*

PATENTS

- **Controlling Verification of Key-Value Stores.** Arvind Arasu, Ken Eguro, Raghav Kaushik, Donald Kossmann, Pingfan Meng, Vineet Pandey, Ravi R. (Microsoft Research). 2018.
- **System and Method for Efficiently Migrating Data from Legacy Storage Systems to Newer Object Based Storage Systems.** Vineet Pandey, Chhavi Sharma, Ranjit Kumar, Kaladhar Voruganti, Parag Deshmukh (NetApp). Submitted 2015.

TALKS & DEMOS

Academic

- American Society of Microbiology, SF, CA. 2019
- USC, Computing for Social Good, LA, CA. 2019
- Stanford HCI, CA. 2018

Community outreach

- Citizen Science Expo, San Diego, CA. April 2019
- Citizen Science Association, Raleigh, NC. 2019
- MyLymeData, San Ramone, CA. 2018

- University of Chicago, IL. 2018
- CSCW Doctoral Consortium, NYC. 2018
- Precision Medicine Initiative, La Jolla, CA. 2018
- Learning@Scale, London. 2018
- MIT Teaching Systems Lab, MA. 2018
- MIT Innovation Lab, MA. 2018
- CHI, Denver, CO. 2017
- South Asia Initiative, UC San Diego. 2018
- Research Expo UC San Diego. 2016, 2017, 2018
- Nerd Nite, San Diego, CA. 2018
- Maker Faire, San Diego, CA. 2017
- Fermenter's Club, San Diego, CA. 2018
- Digestive Disease Week, Chicago, IL. 2017
- Health Data Exploration, UC San Diego. 2017
First Prize in Posters category

RESEARCH POSITIONS

Harvard University

Postdoctoral Fellow, Mentor: Krzysztof Gajos

Nov 2019 - present

Design Lab, UC San Diego

Graduate Student, Advisor: Scott Klemmer

Oct 2014 - present

- Designed and evaluated social computing systems for people to perform personally meaningful scientific work by creating hypotheses and designing & running experiments. 19% of hypotheses contained novel insights for microbiome researchers. Multiple communities fleshed out their hypotheses to experimental designs and ran experiments with global participants.

Institute of Science and Technology, Austria

Visiting Student w/Krish Chatterjee

Summer 2015

- Created an evolutionary game-theoretic model to explain how quantity of peer feedback in online classes varies with value and cost of feedback

Database group, Microsoft Research, Redmond

Summer Intern w/Arvind Arasu

Summer 2014

- Developed a high-performance data-structure for integrity checks in database query processing

Advanced Technology Group, NetApp, Bangalore

Research Staff

July 11 - May 13

- Designed a future vaulting system prototype in a clustered OS & implemented network communication
- Reduced recovery time for a datacenter node failure by 60% w/ instantaneous metadata replication
- 20%-time project towards combining deduplication and encryption techniques for cloud storage
- One patent, two in-house research papers, multiple presentations to top product management leaders

Seoul National University, South Korea

Undergraduate Thesis w/Srinivasa Rao Satti

2011

- Developed theoretical bounds on the performance claims of flash memory data structures
- Represented integers in close to optimal number of bits to support increment-like operations

TEACHING & ADVISING

- **Teaching Assistant, CSE 216: Research in Human-Computer Interaction Design**
Curated course reading list, mentored thirteen student projects, taught a lecture
- **Teaching Assistant, CSE 170: Human-Computer Interaction Design**
I was the tech lead TA, and ran two 15-person sections. Sections followed a flipped model of instruction where I mentored students projects. Steps included needfinding, making paper prototypes, run-ning user studies, building the app, running experiments, and sharing results

- **Teaching Assistant**, *DSGN 1: Introduction to Design*
Flipped model where students read relevant portions of Design of Everyday Things; I mentored student projects in classroom and office hours
- **Teaching Assistant**, *CSE 151: Undergraduate Machine Learning*
Created problem sets, taught extra hour lessons, clarified students' questions
- **Professional Assistant (Undergraduate)**, *Digital Electronics and Computer Organisation course at BITS Pilani*
Assisted faculty in class hour teaching, cleared course concepts to students
- **Mentor**, *2 graduate students, 11 undergraduates, and 1 high school student*
Students worked with me to design, program, and learn how to present research. For each, this was their first HCI research experience. Two are pursuing graduate degrees, six are completing studies at UC, and five who graduated work at technology companies such as Google, TaskRabbit, and PlanGrid.
PhD Sam Lau, UCSD Cognitive Science
MS Tushar Koul → TaskRabbit
BS
Liby Lee → Coursera → U.Penn. CS PhD
Rachel Chen → MS (HCI) Georgia Tech
Aliyah Clayton, Cypress College → UC Irvine BS
Chen Yang → GoDaddy → Google
Cody Doan → Viasat
Brian Soe → GE Digital → PlanGrid
Crystal Kwok → Bluebeam
Dingmei Gu (at UCSD)
Hedy Wang (at UCSD)
Dream Fellowship Program through Undocumented Student Services at UC San Diego
Orr Toledano (at UCSD)
Kaung Yang → ServiceNow
High school Robert Goebel

SERVICE & OUTREACH

Program Committee member ACM CHI 2021, ACM CSCW 2021, ACM Designing Interactive Systems 2021, ACM Creativity & Cognition 2021, LIMITS 2021, ACM Creativity & Cognition 2020, ACM Learning@Scale 2019

Reviewer: 2020: CSCW, WISH; 2019: DIS; CHI 2018, CHI 2017, UCSD ESRP program

Human-Computer Interaction Area Lead for CSE Visit Day 2015 at UC San Diego

Scientific Advisor for ColonyB - a Game with a Purpose to cluster microbiome data

President of Association of Indian Graduate Students at UC San Diego (2015-2016)

Presenter, San Diego Fermentation Festival 2019

Judge, Scripps Research competition – Nithya

Mentor, 2017 UCSD STARS (Summer Training Academy for Research Success) program

Organizer, 2011 Alumni Research Talks, BITS Pilani, India

Member, 2017 South Asia Initiative, UC San Diego

- *CSE Visit Day*, UC San Diego 2017, 2018

HONORS

- 2012: Honorable Mention in *Innovation* and *Teamwork* categories at NetApp CTO Innovation awards
- 2006: Selected for Bachelors in Statistics, Indian Statistical Institute (*30 students across India*)
- 2005: Qualified for Indian National Olympiad in Informatics (*Top 1.5% of 50000*)

- 2004: National Talent Search Scholar (*Top 1% of 100000*)
- 2004-2006: All India Ranks *4, 6, and 9*, National Cyber Olympiads

UNDERGRADUATE RESEARCH EXPERIENCE

Participant , Microsoft Research Summer School Talks and activities about using technology to solve socio-economic problems	<i>Summer 2010</i>
Summer Intern , Chinese University of Hong Kong Constructing convolutional multicast codes for any arbitrary network with cycles	<i>Summer 2009 Networks Theory</i>
Research Intern , Indian Statistical Institute, Kolkata Finding nearby devices without exchanging exact locations	<i>Jan-April 2009 Security, Privacy</i>
Trainee , Vikram Sarabhai Space Centre, Trivandrum Prototype design of crew health monitoring system	<i>Summer 2008 Circuit Design</i>

REFERENCES

- 1 **Krzysztof Z. Gajos** *kgajos@g.harvard.edu*
Professor, Computer Science and Engineering
Harvard University
- 2 **Scott Klemmer** *srk@ucsd.edu*
Professor, Cognitive Science & Computer Science and Engineering
UC San Diego
- 3 **Anoopum S. Gupta** *agupta20@partners.org*
Neurologist, Mass General Hospital
Harvard Medical School
- 4 **Don Norman** *dnorman@ucsd.edu*
Director, The Design Lab
Professor Emeritus of Psychology, Cognitive Science, & Electrical and Computer Engineering
UC San Diego
- 5 **Jim Hollan** *hollan@ucsd.edu*
Distinguished Professor of Cognitive Science & Professor of Computer Science and Engineering
UC San Diego
- 6 **Rob Knight** *robknight@ucsd.edu*
Professor, Department of Pediatrics & Computer Science and Engineering
UC San Diego