

# conference.program

11.1.16

9am

Title	Presenter	Notes
<b>Mezzanine Lounge</b>	<b>with Prof. Lou Braid</b>	
How Accurate is a Drug Test?	Maria Messick	1 *
Depth First Search: Using Computers to Intelligently Solve Mazes	Aritro Biswas	1
Origami Folding Algorithms: Unveiling the Mystery Behind Folded Structures	Lisa Deng	1
Prisoner's Dilemma: Beating out your competition	Elizabeth Eastman	17
Counting Cards: How Google Analyzes a Billion People's Data	Hunter Gatewood	1
<b>Twenty Chimneys</b>	<b>with Emily Zhang</b>	
Let's Make Things Spin! How Electric Motors Work	Priya Kikani	1
Turing Machines: The Original Computers	Nicholas Matthews	1 *
Callbacks in Computer Science: Stop Waiting Around!	Sean Soni	1
(no title)	Alexander Smith	7
The Nyquist Rate: Why Spinny Things Sometimes Look Like They Are Spinning The Wrong Way	Christopher Desnoyers	7
<b>PDR 1</b>	<b>with Professor Leslie Kolodziej</b>	
PageRank: How Important is Your Website?	Michelle Lauer	9 *
Optimizing an algorithm (Fibonacci)	Sharon Kipruto	9
Operating Systems	Rachel Lathe	9
How the Internet Works	Ruth Park	9
How do we convey the glass without touching surface?	Taeyoung Yoon	9
<b>Lobdell Balcony</b>	<b>with Remi Mirkat</b>	
Dealing with a heap of money like a computer scientist	John La	8 <
How to Win at Poker: Counting Strategies	Suri Bandler	7 <
How to get Obama's email	Luana Lopes Lara	9 *
How Hacking a Computer is Just Like Robbing a House	Andrew Montanez	7
<b>Coffeehouse Lounge</b>	<b>with Professor Collin Stultz and Phoebe Tse</b>	
The Universe: How we got to Now	Christian Cardozo Aviles	17 *
Copy/Paste, Counterpoint, and Classical Music	Alexander Campillanos	17
Thanks for the Memory ft. Dynamic Programming	Kelsey Chan	17
How does the Internet seem to always keep you online?	Dayanna Espinoza-Silva	17 *
Onion Routing: Maintaining Anonymity on the Internet	Henry Tareque	17
<b>PDR 2</b>	<b>with Professor Dirk Englund</b>	
How to Bet on Anything	Jerry Wu	28 *
The Physics of the MOSFET	Joshua Sloane	27
Introduction to K-Means Clustering	Aasavari Phanse	27
RSA Encryption (Or how to pass secret notes in class!)	Abigail Russell	28
Trains and Tumors: Understanding the Genes that Cause Cancer	Evan Crane	27

Title	Presenter	Notes
<b>Coffeehouse Lounge</b>	<b>with Professor Collin Stultz</b>	
Strobe Photography: Capturing the Instantaneous	David Houle	18 *
Organizing Your Music Library	Ziad Baaklini	18
How to Get Through a Corn Maze	Connie Siu	18
How Computers Learn Words Without Being Taught	Zygimantas Straznickas	18
Evolution of Encryption	Ryan Stuntz	18
<b>Lobdell Balcony</b>	<b>with Phoebe Tse and Remi Mirkat</b>	
Bitcoin Trading with Bayesian Regression	Anvita Pandit	18 *
Things we know we can't know	Trevor Henderson	8
How to Create Panoramic Images Using Computer Vision	Jose Zuniga	18
WARNING! Race Conditions May Result in Unpredictable Programs	Nicole OBrien	10
How Your Favorite iPhone and Web Apps are Built	Kevin Shum	10
Matter and Space	Brindha Kannan	18
<b>PDR 1</b>	<b>with Professor Leslie Kolodziejski</b>	
Space-time and Baseball	Zachary Hulcher	10 *
How to be the World's Laziest Programmer with Amb and Require	Geoffrey Gilmore	10
Sending Secret Messages Using Simple Ciphers	Karleigh Moore	10
Putting Everything in Order – How Computers Sort Things	Jade Philipoom	10
Spelling Correction with Levenshtein Automata	William Roddenberry	10
Letting Computers Diagnose Your Illness: Intro to Rule-Based Systems	Laura Ting	10
<b>Mezzanine Lounge</b>	<b>with Professor Lou Braid</b>	
Qubits: A New Way to Compute	Bennett Amodio	2 *
Ray Tracing: Generating Realistic Images by Taking Photos in Reverse	Nathan Gutierrez	2
RAFT: Helping Your Mars Rovers Communicate	Carlos Henriquez	2
Kolmogorov Complexity: Why most sequences can't be easily described	Lisa Zahray	2
How Google Maps Figures Out Which Way to Go: Dijkstra's Algorithm	Annie Phan	2
<b>Twenty Chimneys</b>	<b>with Emily Zhang and Robert Ramirez</b>	
Strobes – Making Objects Stand Still	Elaine Lin	2 <
How your computer gets Google's IP Address	Zachery Miranda	2 *
How to Keep Track of Spare Parts	Will Reyes	2
Language from a Machine's Perspective	Justine Jang	22
How to Move Video Game Characters	John Stephens	22
<b>PDR 2</b>	<b>with Professor Tomas Palacios</b>	
How to Win a Game Show	Arezu Esmaili	22 *
Breaking Down Words with Friends	Garron Charles	22
Molecular self-assembly: how to easily design nanoparticles	Anastasia Dosca	22
Network Flow: What Rivers and Baseball Playoffs Have in Common	Theron Nipson	22
Finding the Signal Recipe: The Basics of the Fourier Transform	Sienna Ramos	22
Complexity: Knowing How Fast Your Code Is.... Before You Write It	Jose Salazar	22

Title	Presenter	Notes
<b>PDR 2</b>	<b>with Professor Tomas Palacios</b>	
Word Scoring: How Autocorrect Chooses the Right Match	Jacqueline Liu	23 *
How does it feel to be in charge of an airline? Solving airline scheduling with flow networks	Suyash Fulay	23
BitHacks: Tweaking the Nuts & Bolts of a Computer Program	Isaac Garza	23
Hierarchical Modeling: How Computers Transform Bodies in Animation	Selina Leung	23
Shining a Light on Solar Panels	Elizabeth Schell	23
Infinite Money: The Two Envelope Paradox	Katie Sedlar	23
<b>PDR 1</b>	<b>with Professor Leslie Kolodziejcki</b>	
The Tower of Hanoi Puzzle	Nadia Lucas	11 *
Use the Force (of Light)	Kathy Camenzind	11
How DNA Sequencing Works	Isabel Chien	11
From Points to Curves: How Computers Draw Art	Catherine Li	11
Playing Matchmaker	Dora Tzeng	11
<b>Lobdell Balcony</b>	<b>with Phoebe Tse and Emily Zhang</b>	
How Feedback Helps You Cruise Across the Country	Wei Low	23 *
Drawing with Bezier Curves: The Math Behind Pixar	Christina Sun	23
How to Communicate Quickly and Efficiently: For top secret missions or just loading Facebook	Marisa Rozzi	11
How computers see images	Vickie Ye	11
Git Version Control	Megan Gebhard	7
K-Means: From data to knowledge	David Mayo	28
<b>Mezzanine Lounge</b>	<b>with Professor Lou Braid</b>	
The St. Petersburg Paradox	Yanqi Chen	3 *
LZW Compression: How to Say More with Less	Xuan Bui	3
How to Make a Pixar Movie	Evan Denmark	3
Onion Routing: How to Cleverly Communicate Covertly	Michael Feffer	3
Classification Trees: WHAT ARE THOOOSE?	Daniel Lerner	3
<b>PDR 4</b>	<b>with Jason Tong and Yola Katsargyri</b>	
Subtle Bragging: Multi-party Computation and How it Works	Daniel Shaar	3 *
How to Simulate the Universe	Ethan Witt	3
Market Making: Easy Money?	Brian Saavedra	3
Minimax: How Computers Beat Grandmasters at Chess	David Zheng	13
Using Bayes' Rule to Model How Humans and Robots Think	Madeleine Severance	13
<b>Twenty Chimneys</b>	<b>with Professor Joe Steinmeyer</b>	
Virtual Memory: Stop Apps from Fighting	Julian Delorme	13 *
Cyberspying without code	Corey Cleveland	13
Simultaneous Localization and Mapping	Mubarik Mohamoud	13
Network Centralities: Who is important?	Alex Luh	13
Fiber Optics: Connecting the World with Light	Alan Medina	13
How to catch a Pokémon?	Sudhanshu Mishra	13

**Coffeehouse Lounge**

Dealing with a Noisy World: Fourier Transforms and Filters  
 Let it Crash: Handling the unpredictable in computer programs  
 The Future of Wireless Charging  
 Strategies for Two Player Games  
 How to Share Nuclear Launch Codes (and Other Secrets)  
 How to Steal Passwords: SQL Injection Attacks

**with Professor Collin Stultz**

David Gomez 19 \*  
 Aneesh Agrawal 19  
 Oscar Guevara 19  
 Steven Hao 19  
 Linda Liu 19  
 Julia Wu 19

12pm

Title	Presenter	Notes
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**Coffeehouse Lounge**

Should Everyone Get Candy? – Proof by Induction  
 How to Make Your Car Fast and Furious  
 The Vector Space Model (Or What You Should Watch Next on Netflix)  
 Singular Value Decomposition: Capturing the essence of a picture  
 Understanding Radix Sort  
 Simpson's Paradox: Who gets more dates: Me or Brad Pitt?

**with Professor Collin Stultz**

Christina Martinez-Acha 20 \*  
 Rita Ainane 20  
 Rebekah Bell 20  
 Osmany Corteguera 20  
 Chandani Doshi 20  
 Fernando Varela 20

**PDR 1****with Robert Ramirez and Emily Zhang**

Git-ting Smart With Your Files: How to Rage At Your Computer Just A Little Less  
 Size Matters  
 Mathematical Multitasking: In Pursuit of Better Graphics  
 Conditional Probability and the Monty Hall Problem  
 Prisoner's Dilemma: Why you should never trust your partner

Gregory Young 8 <  
 Kevin Ng 24 \*  
 Andrew Reilley 24  
 Jessica Fang 19  
 Mesert Kebed 8 >

**Twenty Chimneys**

Saving Society with Semaphores  
 The Monty Hall Problem  
 Preventing an invasion with Neural Networks  
 Quantum Mechanics and You  
 The Pigeonhole Principle & Beyond: Proofs About Socks, Oranges, & Hair

**with Professor Joe Steinmeyer**

Anne Kelley 14 \*  
 Cavin Mozarni 14  
 Nischal Nadhamuni 14  
 Narindra Peaks 14  
 Elysa Kohrs 14

**PDR 4****with Yola Katsargyri and Jason Tong**

How Do Bots Move So Fast?  
 Cross Site Scripting Attack  
 In Bitcoin We Trust  
 How Video Game AI Works  
 Handling Concurrent Conversations with CDMA

Michael Shum 4 \*  
 John Mikhail 4  
 Nchinda Nchinda 4  
 Raoul Khouri 14  
 George Liang 14

**Mezzanine Lounge**

The Pirate Game: Distributing Treasure  
 As Fast as a Speeding Bullet  
 Divide and Conquer: Solving Hard Problems by Solving Easy Ones  
 MAC Protocols: Communication Without Conflict  
 Data Buffers, or How Your Youtube Videos Load

**with Professor Lou Braid**

Stuart Finney 4 \*  
 Travis Herbanek 4  
 Alex Huang 4  
 Alex Latham 14  
 Yuge Ji 14 >

**PDR 2****with Professor Tomas Palacios**

The FPGA: a million computers in one  
 Keeping Track of a Computer's Kids  
 Count to infinity and beyond  
 How computers efficiently store different versions of your To-Do lists  
 Error Correcting Codes: Conveying Info with Greater Accuracy  
 Scaling: Solving large problems one step at a time

Angus MacMullen 24 \*  
 Famien Koko 24  
 Cheuk Lee 24  
 Bristy Sikder 24  
 Kevin Yang 24  
 Sagnik Saha 24

Title	Presenter	Notes
<b>Mezzanine Lounge</b>	<b>with Professor Dirk Englund</b>	
Editing DNA with CRISPR Scissors	Helen Abadiotakis	25 *
AlphaGod: How the Machine beat the Man	Kai Aichholz	25
Shortest-Path Finding	Benjamin Lin	27
Detecting Fake Data: Benford's Law	Tomas Calderon	28
Grocery Shopping: The Bin-Packing Problem	Kai Xiao	28
How to win a billion bucks	Alfredo Yanez	28 >
<b>PDR 4</b>	<b>with Yola Katsargyri</b>	
How Concerts Help Us Understand Data Storage	Kayode Ezike	25 *
Quantum Cryptography: The Unbreakable Cipher	Brandon Sanchez	25
Making Multiplication Faster with the Karatsuba Algorithm	Jennifer Tylock	25
Using Your Cache Wisely	Douglas Kogut	25
Why our planet is doomed: A look into Game Theory	Julian Ranz	25
Magnetic Circuits	Tianye Chen	25
<b>PDR 2</b>	<b>with Tomas Palacios</b>	
Bitcoin: Magical Digital Money	Natalie Coleman	21 *
Compression: More information: less space	Joren Lauwers	21
Binary Search Explained: As Easy as Finding Words in a Dictionary	Gustavo Montalvo	21
AJAX: Stronger Than Long Load Times	Chris Womack	21
First-Order Circuit Filters	Juan De Jesus	21
<b>Coffeehouse Lounge</b>	<b>with Professor Kimberle Koile</b>	
Reverse Engineering Smoothies with Math	Phillip Cherner	5 *
How to Control Almost Anything	Douglas Chambers	5
Why Wheels Do Strange Things On Camera	Israel Donato-Ridgley	5
Identity Based Encryption: The Locked Boxes and Keys in Your Computer	Jakob Weisblat	8
Hash Functions: Speedy Searches for Quicker Computers	Harrison Okun	5
<b>PDR 3</b>	<b>with Sarah Tortorici and Robert Ramirez</b>	
Efficiently Find That Thing You're Looking For	Katie Marlowe	5 *
How to get from Stanford to MIT as quickly as possible	Rachel Rotteveel	5
Reduced Size Without Reduced Detail: Reduced Repitition	Daniel Solomon	5
Particle Systems: Wow, that Water Looks Real!	Reece Tamashiro	5
Time Travel with Special Relativity	David Campeau	21
Adversarial Search: How Computers Play Games	Jeremy Wright	21
<b>Twenty Chimneys</b>	<b>with Professor Joe Steinmeyer</b>	
How Brain Cells Communicate – Why we laugh, learn, and love	Runpeng Liu	16 <
How can we measure a car's speed using an on-board camera?	Banti Gheneti	15 *
How to Send Secret Information	Lotta Blumberg	15
How to Share a Secret	Brandon Carter	15
Image Filtering Made Easy	Sara Stiklickas	15
<b>PDR 1</b>	<b>with Jason Tong</b>	
The New Password: Your Eyes	Joanna Han	15 *
Is Time Actually Money?	Nicole Lu	15
What is Pipelining? Do Laundry Faster and Make Netflix Load More Quickly	Lorenzo Viganò	15
Computer Vision for Dummies	Pravina Samaratunga	16
How to count Skittles quickly with MapReduce	Dang Pham	16

Title	Presenter	Notes
<b>Mezzanine Lounge</b>	<b>with Professor Dirk Englund</b>	
Analyzing Social Networks Through Centrality Measures	Tyler Finkelstein	26 *
Understand and Fix Your Slow Wifi	Reo Baird	26
Command Line Pipes	William Navarre	28
Rule-based systems: A sneak peek into Artificial Intelligence	Adarsh Jeewajee	27
Skip Lists – Express Trains for Lists	Botong Ma	27 >
<b>PDR 4</b>	<b>with Yola Katsargyri</b>	
Long Distance Radio Communications or How Do Our Satellites Phone Home?	Alex Sloboda	26 *
Collect Data Lazily, Get Away With It	Descartes Holland	26
Tell a Lie Often Enough...	Arman Rahman	26
Collisions in Storage: How Pigeonhole Principle Shows they are Inevitable	Tim Zhong	26
Parkinson's Evil Twin	Michael Castano	26
<b>Twenty Chimneys</b>	<b>with Professor Leslie Kolodziejski</b>	
Just Google It: How Search Works	Ismael Gomez	12 *
The Math Behind Card Counting	Diego Cornejo	12
Number of Paths on the NYC Grid	Amber Guo	12
How to be a Better Decision Maker	Willow Jarvis	12
Understanding Circuits and Why Electrical Plugs Have Three Prongs	Michelle Qiu	12
<b>PDR 2</b>	<b>with Phoebe Tse</b>	
How to be an Efficient Doctor – The Viterbi Algorithm	Aofei Liu	28 <
Friendship Paradox – Why Your friends have more friends than you	Joy Yu	12 *
How to organize your fat stacks of cash really quickly using Mergesort	Jonatan Yucra Rodriguez	12
Li Ion Battery Management Systems	Eric Ponce	27 >
Threads and Locking, Find the Race Condition Win a Prize	Kenny Gea	27 >
<b>Coffeehouse Lounge</b>	<b>with Professor Kimberle Koile</b>	
Drawing Lines for Fun, Profit, and Classification (aka the joys of linear separators)	Lei Ding	7 *
Finding a moment in a videostack	Ali-Amir Aldan	6
Hacking Passwords 101	Nikita Kodali	8
The Halting Problem A.K.A. Will Grandma Ever Stop Talking?	Vincent Anioke	7 >
How to Make Your Computer Play (and win!) the Game of 20 Questions	Spencer Bard	7 >
Gene Drives – A method for editing a species or driving it to extinction	Damien Martin	8 >
<b>PDR 3</b>	<b>with Sarah Tortorici</b>	
Winning Board Games without any Real Skill	Keith Galli	6 *
Mr. Steal Your Prom Date	Sravya Bhamidipati	6
How to be a Particularly Good Finder	Jackie Liu	6
How To Make Super Babies	Crystal Pan	6
How to prove things certainly exist, by only proving that they probably exist	Michael Wallace	6

## PDR 1

How to Share Secrets With Your Friends

Your computer perceiving the world. Why you and your computer both trip-up on the McGurk effect.

How Computers Remember Your Cat Videos

Traveling for Cheap: How to Find the Cheapest Flight Paths Around the World!

Solving mazes with Depth First Search

with Jason Tong

Edward Park 16 <

Alexander List 16 <

Leopoldo Calderas 16 \*

Danielle Penney 16

Gregory Hui 16

## Special thanks to:

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