

# 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
(no title)	Christopher Desnoyers	7
<b>PDR 1</b>	<b>with Professor Leslie Kolodziejski</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 Kolodziejewski</b>	
Space-time and Baseball	Zachary Hulcher	10 *
How to be the World's Laziest Programmer	Geoffrey Gilmore	10
Sending Secret Messages Using Simple Ciphers	Karleigh Moore	10
Putting Everything in Order – How Computers Sort Things	Jade Philipoom	10
Did you mean... 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
(no title)	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)  
 (no title)

**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
-------	-----------	-------

**Coffeehouse Lounge**

(no title)  
 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****with Professor Joe Steinmeyer**

Saving Society with Semaphores  
 (no title)  
 The Monty Hall Problem  
 (no title)  
 Quantum Mechanics and You  
 The Pigeonhole Principle & Beyond: Proofs About Socks, Oranges, & Hair

Anne Kelley 14 \*  
 Samantha Fierro 14  
 Cavin Mozarmi 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****with Professor Lou Braid**

The Pirate Game: Distributing Treasure  
 As Fast as a Speeding Bullet  
 Divide and Conquer: Solving Hard Problems by Solving Easy Ones  
 How can multiple people share the same communication medium?  
 Data Buffers, or How Your Youtube Videos Load

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

**PDR 2**

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

with Professor Tomas Palacios

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

1pm

Title

Presenter Notes

**Mezzanine Lounge**

Editing DNA with CRISPR Scissors  
 AlphaGod: How the Machine beat the Man  
 Shortest-Path Finding  
 Detecting Fake Data: Benford's Law  
 Grocery Shopping: The Bin-Packing Problem  
 How to win a billion bucks

with Professor Dirk Englund

Helen Abadiotakis 25 \*  
 Kai Aichholz 25  
 Benjamin Lin 27  
 Tomas Calderon 28  
 Kai Xiao 28  
 Alfredo Yanez 28 >

**PDR 4**

How Concepts Help Us Understand Data Storage  
 Quantum Cryptography: The Unbreakable Cipher  
 Making Multiplication Faster with the Karatsuba Algorithm  
 Using Your Cache Wisely  
 Why our planet is doomed: A look into Game Theory  
 Magnetic Circuits

with Yola Katsargyri

Kayode Ezike 25 \*  
 Brandon Sanchez 25  
 Jennifer Tylock 25  
 Douglas Kogut 25  
 Julian Ranz 25  
 Tianye Chen 25

**PDR 2**

Bitcoin: Magical Digital Money  
 Compression: More information: less space  
 Binary Search Explained: As Easy as Finding Words in a Dictionary  
 AJAX: Stronger Than Long Load Times  
 First-Order Circuit Filters

with Tomas Palacios

Natalie Coleman 21 \*  
 Joren Lauwers 21  
 Gustavo Montalvo 21  
 Chris Womack 21  
 Juan De Jesus 21

**Coffeehouse Lounge**

Reverse Engineering Smoothies with Math  
 How to Control Almost Anything  
 Why Wheels Do Strange Things On Camera  
 (no title)  
 Hash Functions: Speedy Searches for Quicker Computers

with Professor Kimberle Koile

Phillip Cherner 5 \*  
 Douglas Chambers 5  
 Israel Donato-Ridgley 5  
 Jakob Weisblat 8  
 Harrison Okun 5

**PDR 3**

Efficiently Find That Thing You're Looking For  
 How to get from Stanford to MIT as quickly as possible  
 Reduced Size Without Reduced Detail: Reduced Repetition  
 Particle Systems: Wow, that Water Looks Real!  
 Time Travel with Special Relativity  
 Adversarial Search: How Computers Play Games

with Sarah Tortorici and Robert Ramirez

Katie Marlowe 5 \*  
 Rachel Rotteveel 5  
 Daniel Solomon 5  
 Reece Tamashiro 5  
 David Campeau 21  
 Jeremy Wright 21

**Twenty Chimneys**

How Brain Cells Communicate – Why we laugh, learn, and love  
 How can we measure a car's speed using an on-board camera?  
 How to Send Secret Information  
 How to Share a Secret  
 Image Filtering Made Easy

with Professor Joe Steinmeyer

Runpeng Liu 16 <  
 Banti Gheneti 15 \*  
 Lotta Blumberg 15  
 Brandon Carter 15  
 Sara Stiklickas 15

**PDR 1**

The New Password: Your Eyes  
 Is Time Actually Money?  
 What is Pipelining? Do Laundry Faster and Make Netflix Load More Quickly  
 Computer Vision for Dummies  
 How to count Skittles quickly with MapReduce

with Jason Tong

Joanna Han 15 \*  
 Nicole Lu 15  
 Lorenzo Viganò 15  
 Pravina Samarantunga 16  
 Dang Pham 16



Title

Presenter Notes

**Mezzanine Lounge**

(no title)  
 Understand and Fix Your Slow Wifi  
 (no title)  
 Rule-based systems: A sneak peek into Artificial Intelligence  
 Skip Lists – Express Trains for Lists

with Professor Dirk Englund

Tyler Finkelstein 26 \*  
 Reo Baird 26  
 William Navarre 28  
 Adarsh Jeewajee 27  
 Botong Ma 27 >

**PDR 4**

Long Distance Radio Communications or How Do Our Satellites Phone Home?  
 Collect Data Lazily, Get Away With It  
 Tell a Lie Often Enough...  
 Collisions in Storage: How Pigeonhole Principle Shows they are Inevitable  
 Parkinson's Evil Twin

with Yola Katsargyri

Alex Sloboda 26 \*  
 Descartes Holland 26  
 Arman Rahman 26  
 Tim Zhong 26  
 Michael Castano 26

**Twenty Chimneys**

Just Google It: How Search Works  
 The Math Behind Card Counting  
 Number of Paths on the NYC Grid  
 How to be a Better Decision Maker  
 Understanding Circuits and Why Electrical Plugs Have Three Prongs

with Professor Leslie Kolodziejski

Ismael Gomez 12 \*  
 Diego Cornejo 12  
 Amber Guo 12  
 Willow Jarvis 12  
 Michelle Qiu 12

**PDR 2**

How to be an Efficient Doctor – The Viterbi Algorithm  
 Friendship Paradox – Why Your friends have more friends than you  
 How to organize your fat stacks of cash really quickly using Mergesort  
 Li Ion Battery Management Systems  
 Threads and Locking, Find the Race Condition Win a Prize

with Phoebe Tse

Aofei Liu 28 <  
 Joy Yu 12 \*  
 Jonatan Yucra Rodriguez 12  
 Eric Ponce 27 >  
 Kenny Gea 27 >

### Coffeehouse Lounge

Drawing Lines for Fun, Profit, and Classification (aka the joys of linear separators)

Finding a moment in a videostack

Hacking Passwords 101

The Halting Problem A.K.A. Will Grandma Ever Stop Talking?

How to Make Your Computer Play (and win!) the Game of 20 Questions (no title)

with Professor Kimberle Koile

Lei Ding 7 \*

Ali-Amir Aldan 6

Nikita Kodali 8

Vincent Anioke 7 >

Spencer Bard 7 >

Damien Martin 8 >

### PDR 3

Winning Board Games without any Real Skill

Mr. Steal Your Prom Date

How to be a Particularly Good Finder

How to make superbabies

How to prove things certainly exist, by only proving that they probably exist

with Sarah Tortorici

Keith Galli 6 \*

Sravya Bhamidipati 6

Jackie Liu 6

Crystal Pan 6

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:

Katherine Touafek (School to Careers Partners)

Dave Medvitz (Pingree)

Benadette Manning (Fenway)

Michele Goe (O'Bryant)

Bob Hall (Newman)

Jason Tong (MIT)

my.notes