

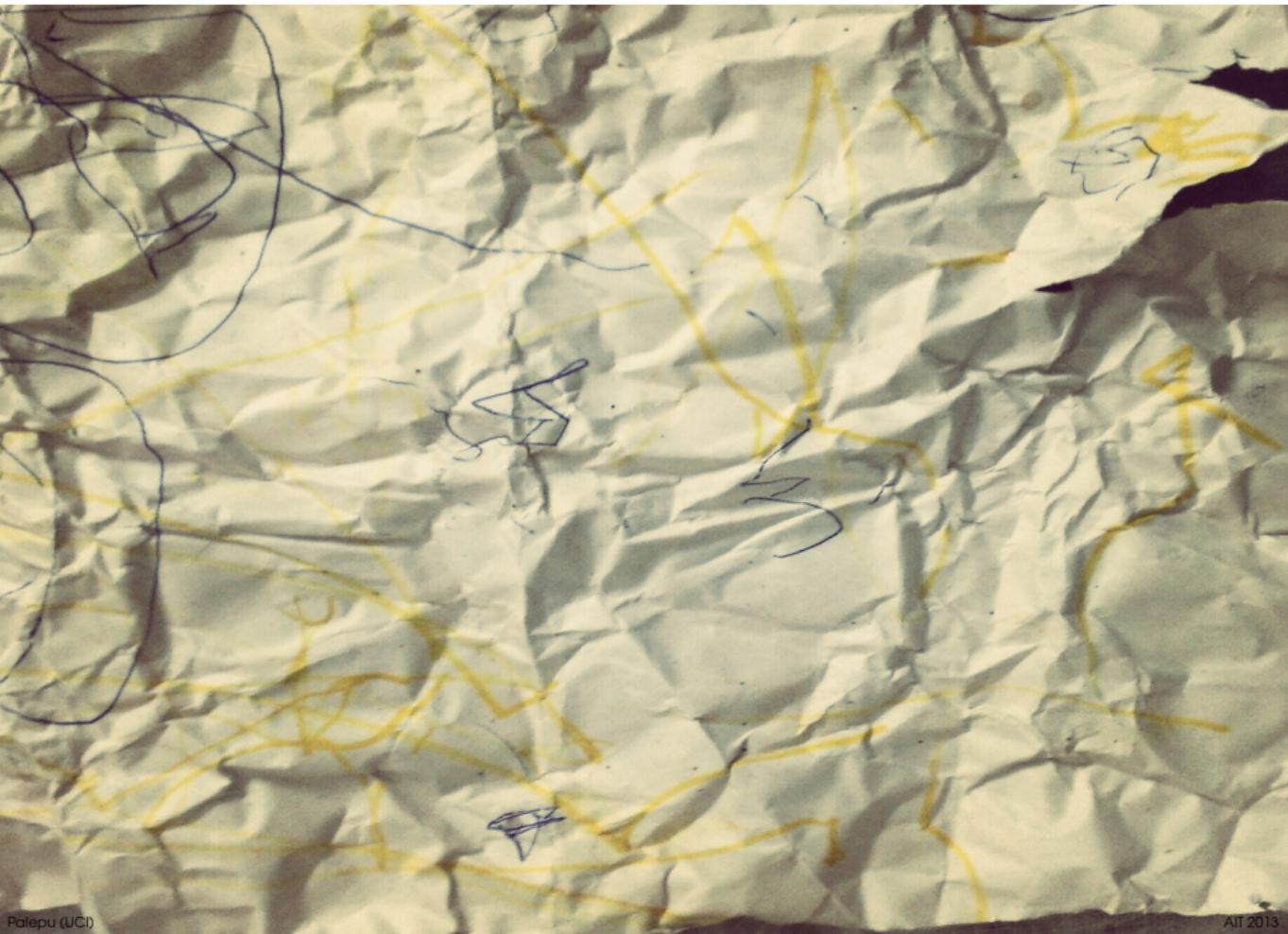
# Being a Student Researcher

Vijay Krishna Palepu

University of California, Irvine, USA

Talk at Army Institute of Technology, University of Pune, 2013





# What is this talk about?

- Saying “Hello!”
- Research in Software Engineering.
- Living and Studying Abroad.
- Anything else that you want to talk/ask about!

# Who am I?

## Vijay Krishna Palepu

- Computer Engineer from AIT, UoP; Passed out in 2010.
- Software Engineering Researcher ... in the making.
- Ph.D. student at University of California, Irvine.
- Living in Irvine, California.
- Software Debugging
- <http://vpalepu.com>

# What do I do?

## **As a software engineering researcher ...**

- I research how to analyze and think about software behavior.
- I analyze software behavior to find software bugs.

# Why Software Behavior and Debugging?

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# Why Software Behavior and Debugging?

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- So debugging became important to me.
- And I often wondered how a software execution looks like.
- **As a researcher I try to solve problems and answer questions that are important to me.**

# How do I approach debugging?

From **Software Behavior Analysis**  
Towards **Debugging**

# What do I mean by software behavior?

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- Bugs come in both forms
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  - Software often executes in unexpected ways.

# What are my research questions?

- How does software behavior look like?

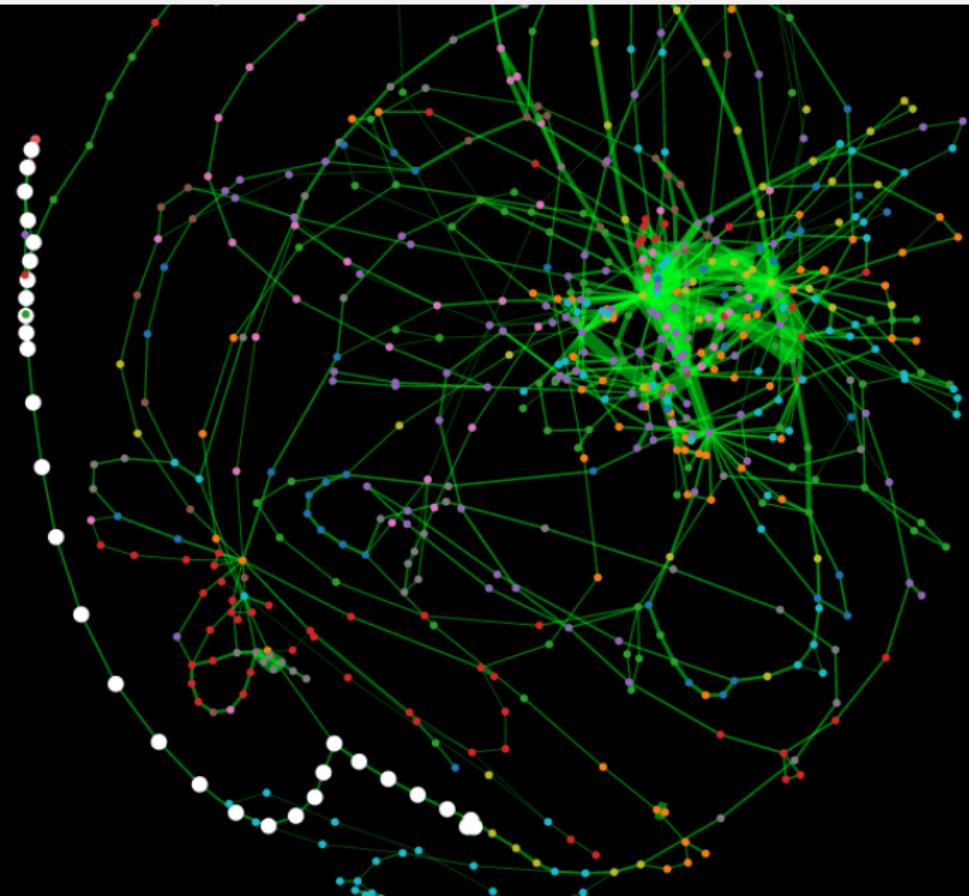
# What are my research questions?

- How does software behavior look like?
- How are instructions in software related to each other?

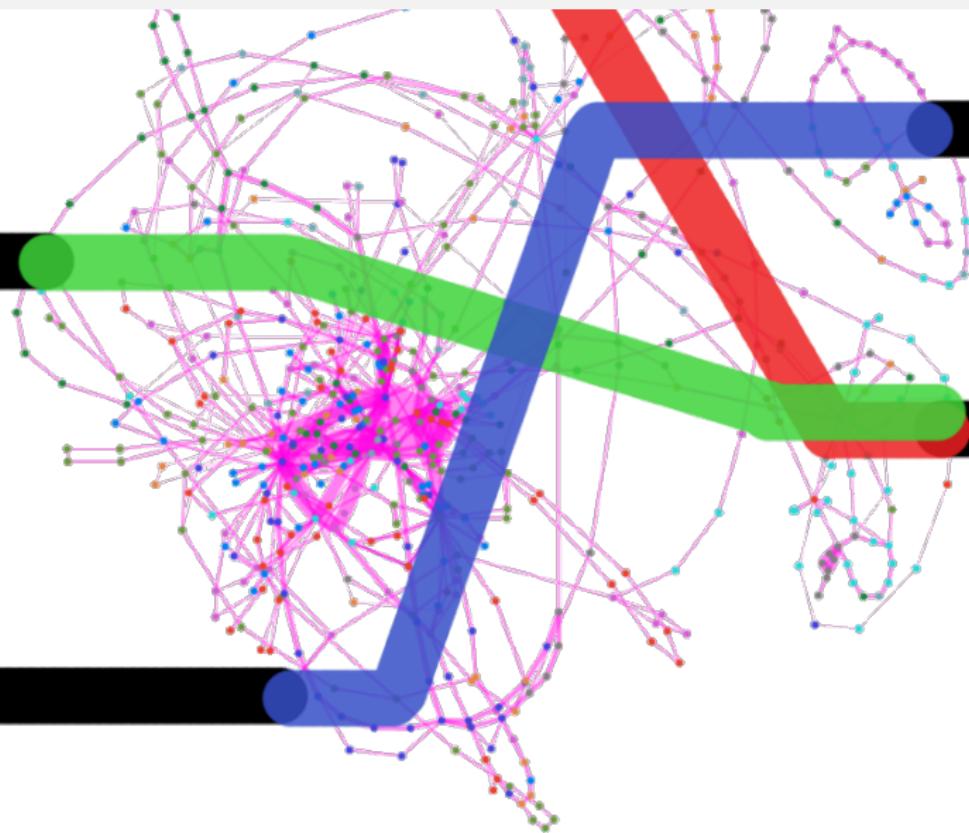
# What are my research questions?

- How does software behavior look like?
- How are instructions in software related to each other?
- To what extent are instructions related to each other?

# How does software behavior look like?



# How & to what extent are instructions related to each other?



# What is a Ph.D. like, especially at UCI?



# UCI is a great place for Engineering ...



# UCI is a great place for Engineering ...



# Dedicated School for Information and Computer Science



# Known for Machine Learning, Software Engineering, Human Computer Interaction



# Irvine?!?

## **Irvine, California.**

- Orange County, Southern California.
- 5 miles from Disney Land!
- 1 hour car ride from L.A.
- 1 hour flight from San Francisco.
- FYI ... Safest city in the U.S. of A.

# Irvine and UCI are beautiful ...



# Irvine and UCI are beautiful ...



# Irvine and UCI are beautiful ...



# Irvine and UCI are beautiful ...



Irvine and UCI are beautiful ...



# The Nightlife is not too bad ...



# The Food ain't bad either ...



# The Food ain't bad either ...



# You get to travel the world



# Zurich, Switzerland



# Zurich, Switzerland



# Zurich, Switzerland



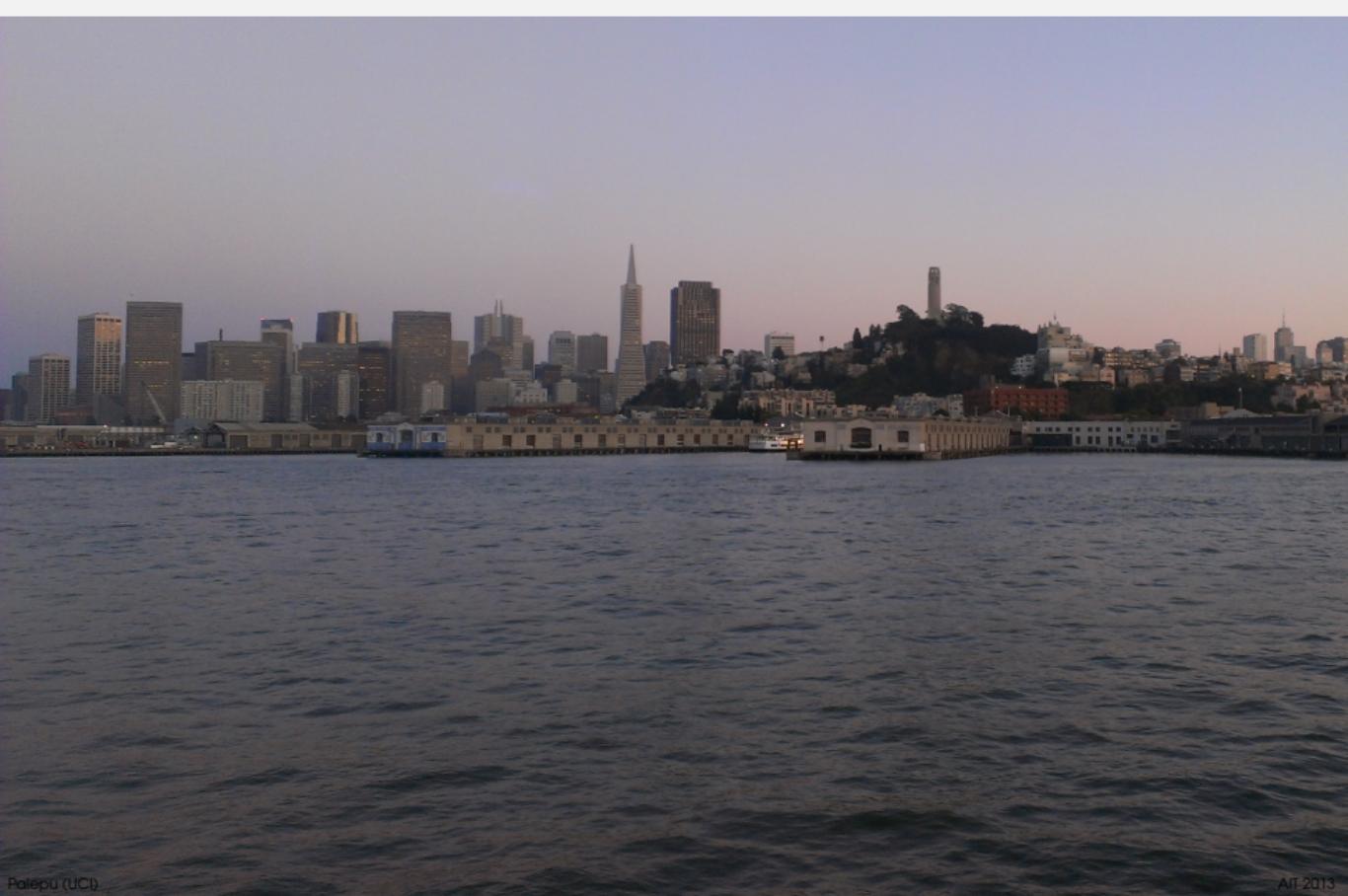
# San Fransisco, CA



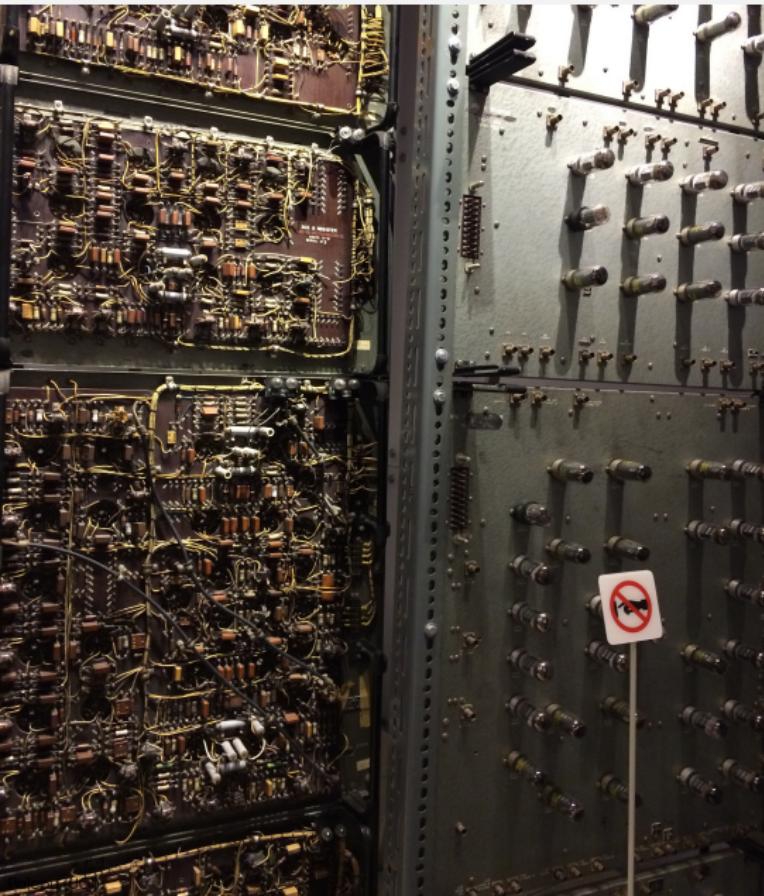
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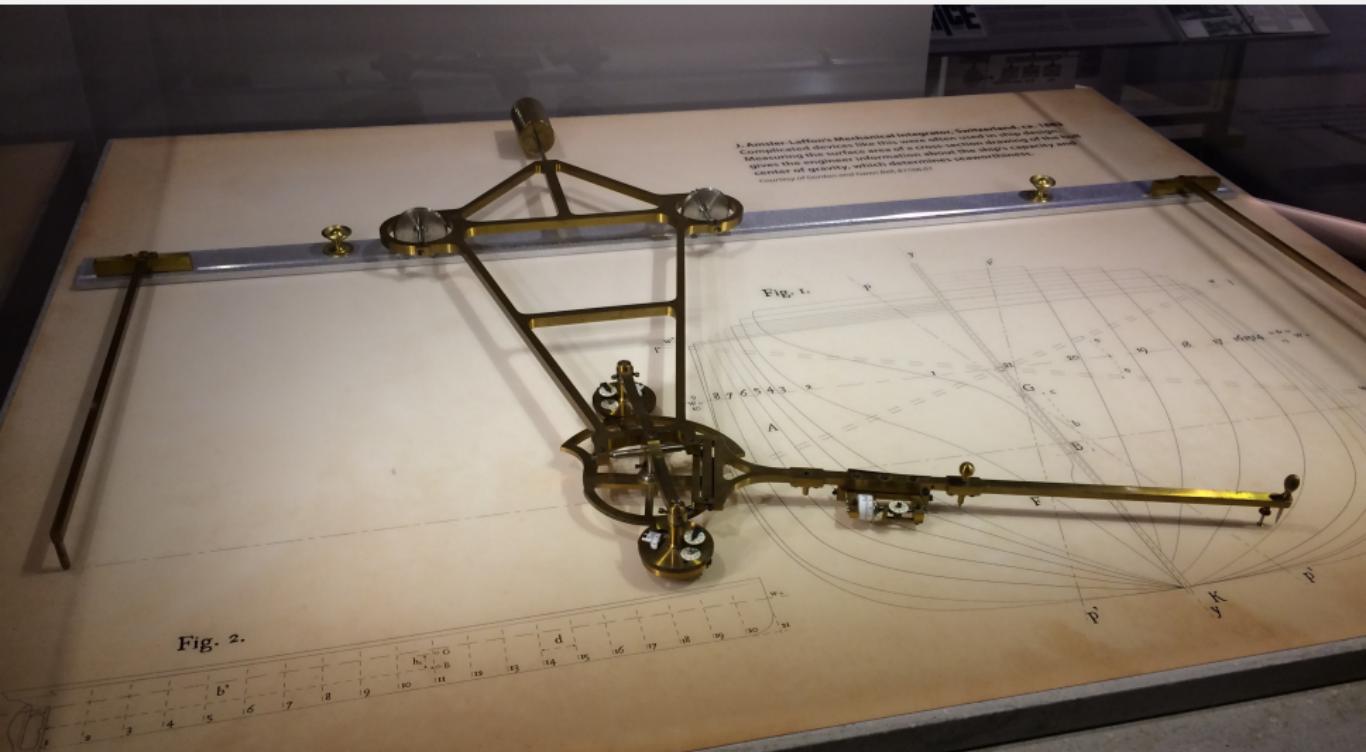
# Computer History Museum, Silicon Valley, CA



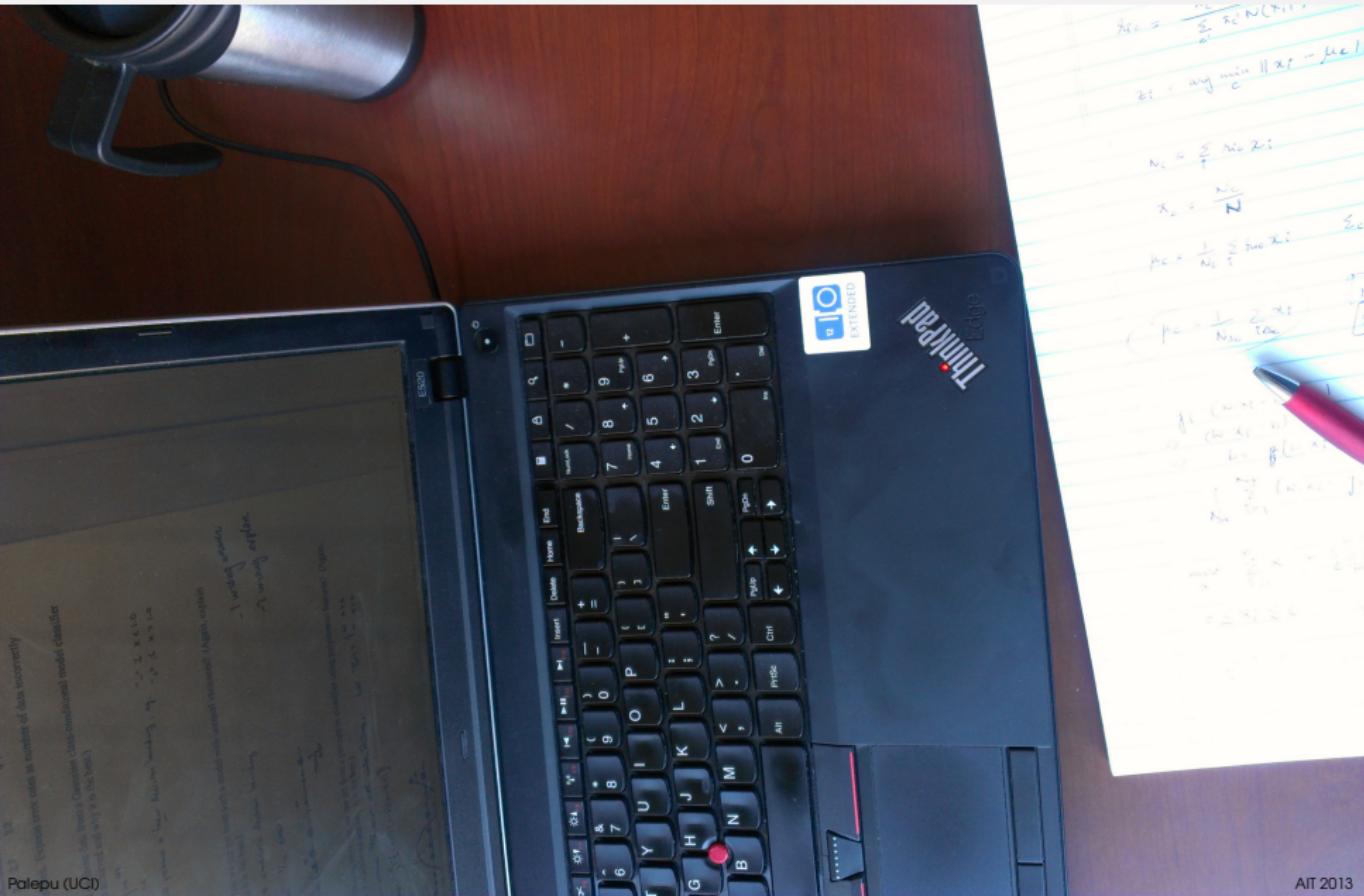
# Computer History Museum, Silicon Valley, CA



# Computer History Museum, Silicon Valley, CA



# It is Hard Work!



# It is Hard Work!

```

    - vars. fName(owner).
      get Field(fdName). getObject
      (object);
object = new object;
// TODO - handle primitives and BREAK.
}

```

$O \{ \{ \text{Owner}.\text{fdName-type} \} \{ \text{Owner}.\text{fdName-type}$

List = { }

Owner . fdName-type,  
Owner2 . fdName2-type2 }

```

int length = list.size();
if (list.get(0) → number) {
    object = objectarray [list.get(0).IntValue()];
} else if (list.get(0).contains("*")) {
    object = class.forName (Owner0).getFil
} else { throw Runtimeexception ("Line"); }

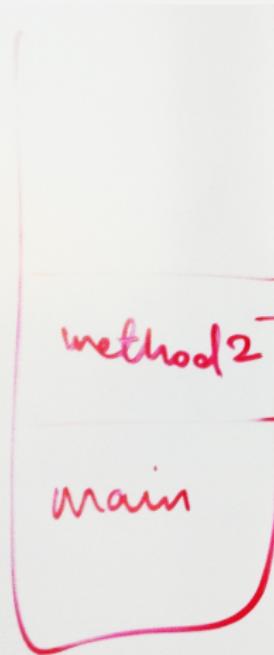
for (int i = 1; i < length; i += 1) {
    String item = list.get(i);
    String owner = item.split ("[.]") [0];
    String fdName = item.split ("[.]") [1];
    String Type = item.split ("[.]") [1].split
}

```

**NOTICE**



# It is Hard Work!



1. Enter flag. → define it.
2. Arguments → Store in argument
3. Actual types → if ! zero arguments
4. Dependencies.

Make each method go  
through these 4 stages  
in THAT order.

# It is Hard Work!

“security  
PacMan

Tetris?  
Ant.

- ✗ Local Vars
- ✗ - loc
- ✗ - sta
- ✗ Returns
- ✗ Line

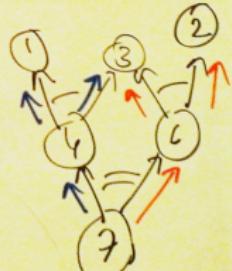
The persistent  
data in the memory  
model / data structure  
will bubble up.  
Given that if/void  
we redefined  
often.

```

1   a = 1
2   b = 2
3   if (i == a) {
4       c = a;
5   } else {
6       c = b;
7   }
8   print(c)

```

Method Instance : ?



"And" for Fan Out  
"Or" for Fan In.

BreakPoint

TODO (Sunday)

Summaries

New XML

- Full

- Simple

- Generics

Related Works

- Abstract

- Partial Section of

Analysis and

Implementation

X Me

X Jump

X Na

Step

Vari

Jump

With

Const

inc

calculated

for border

Reflect

the label

Note labels

are not unique

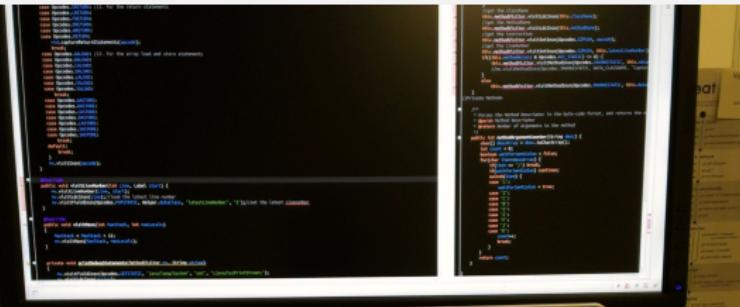
Employ a linear

analysis

# It is Hard Work!

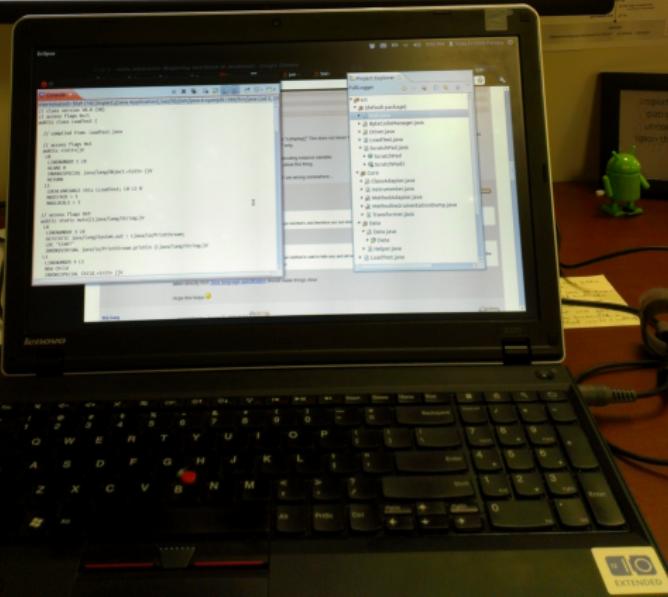
	deadline	notice
ICSE (cm)	Aug 17	Nov 27
ICST	Sept 17	Dec 14
ICSE (short)	Nov 2	Jan 31
ISSTA	Jan 25	May 6
ICPC	Feb 18/est	Mar 23?
ASE	Feb 21/mar??	June 18?
FSE	Mar 16?	June 18?
ICSR	April 15/10?	June 20?
ASE (cont)	May 3?	June 22?
FSE (cont)	June 23?	July 20?
FSE (short)	June 29?	Aug 20?

# It is Hard Work!

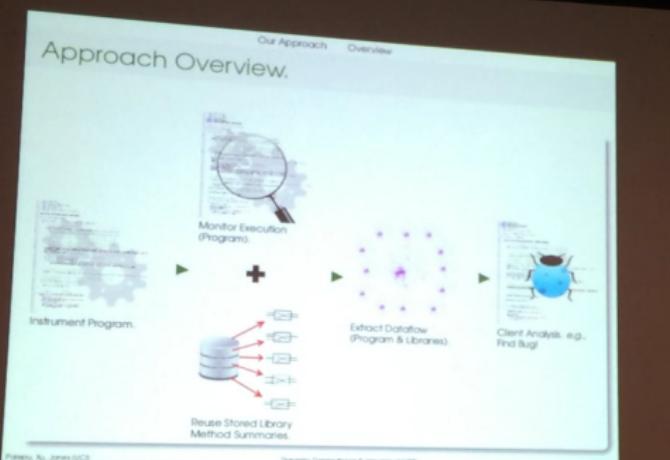


The image shows two computer monitors. The monitor on the left displays a code editor with several tabs open, showing Java-like code. The monitor on the right also displays a code editor with tabs, showing similar code. Both screens have dark themes.

```
public void start(Stage primaryStage) {  
    primaryStage.setTitle("Hello World Application");  
    // Create a canvas  
    Canvas canvas = new Canvas(800, 600);  
    primaryStage.setScene(new Scene(canvas));  
    // Create a rectangle  
    Rectangle rect = new Rectangle(100, 100, 200, 200);  
    rect.setFill(Color.BLUE);  
    rect.setStroke(Color.BLACK);  
    rect.setStrokeWidth(2);  
    // Add the rectangle to the canvas  
    canvas.getChildren().add(rect);  
}  
  
public static void main(String[] args) {  
    launch(args);  
}
```



# It is Rewarding!



# Keep in touch



important truths begin as  
outrageous, or at least  
uncomfortable, attacks  
upon the assumptions of wisdom

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