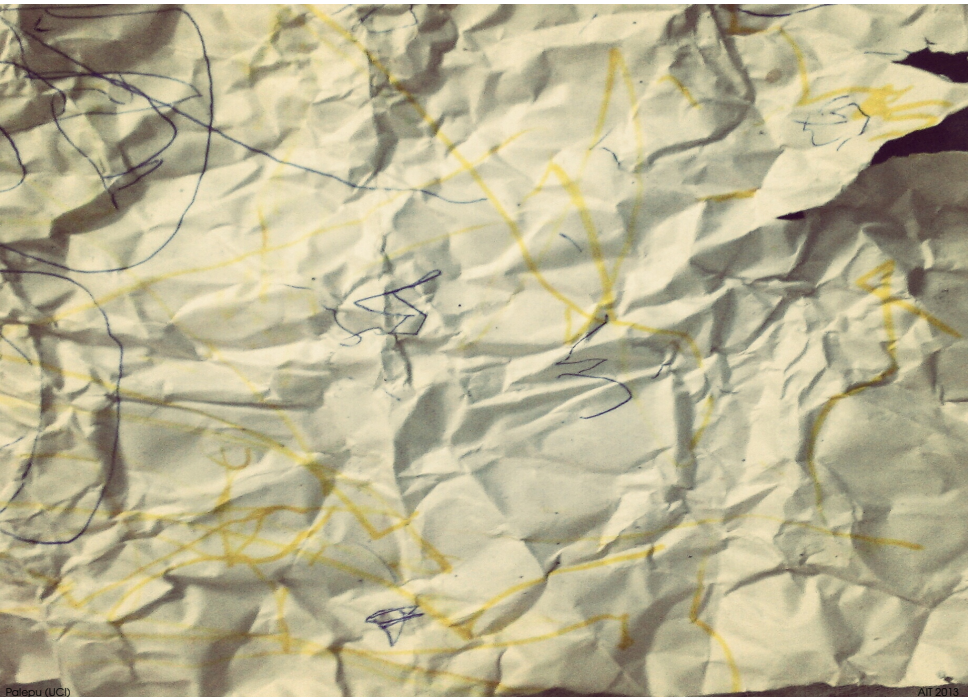


# Being a Student Researcher

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?

- As a programmer I was never good at finding bugs.
- 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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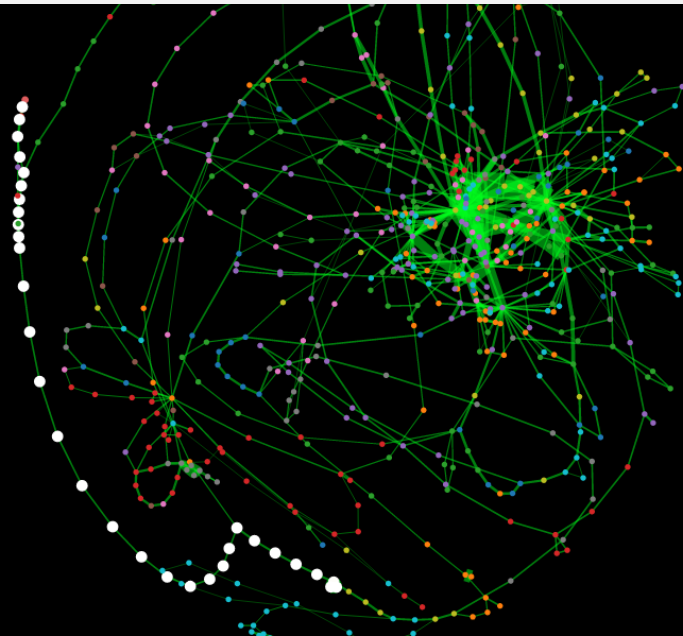
- How does software behavior look like?
- How are instructions in software related to each other?



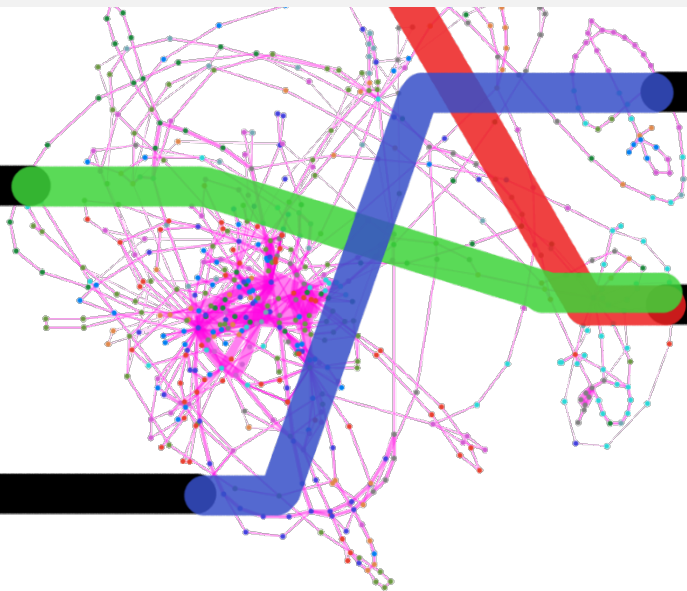
# What are my research questions?

- 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 Fransisco.
- 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 Francisco, CA





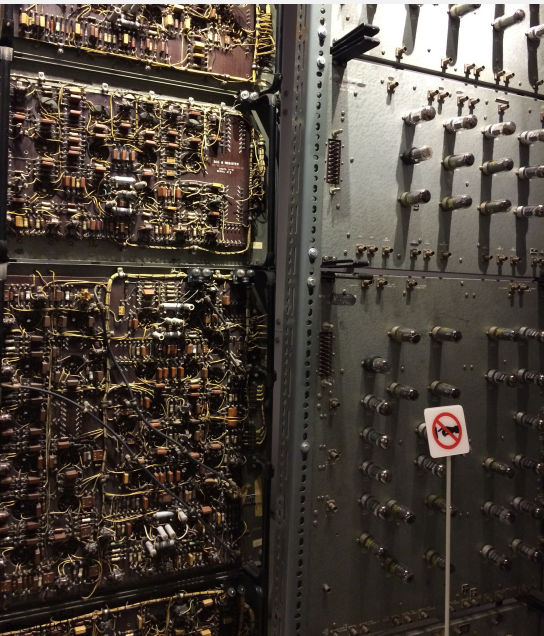
# San Francisco, CA



# San Francisco, CA



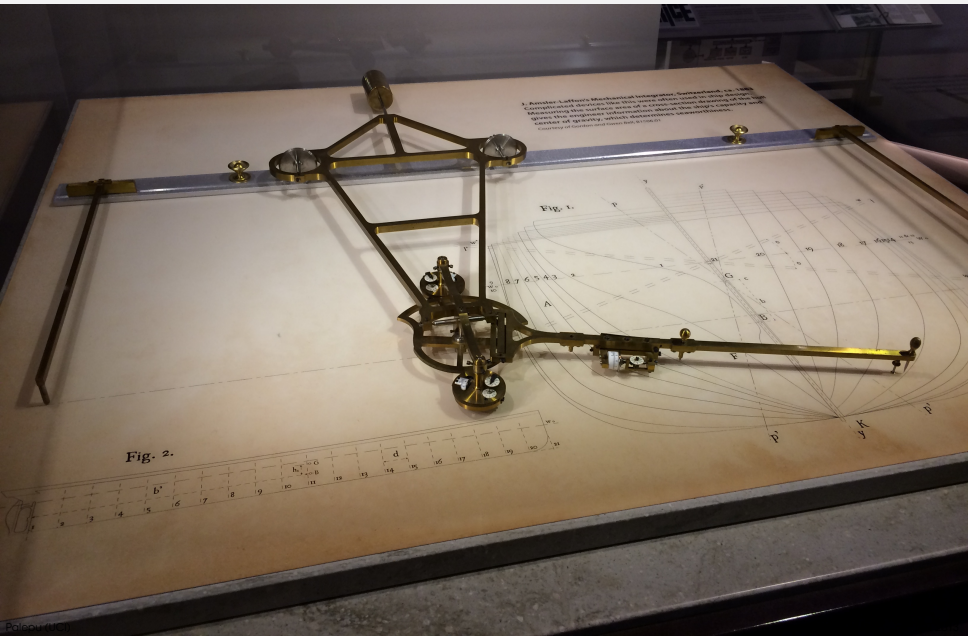
# Computer History Museum, Silicon Valley, CA



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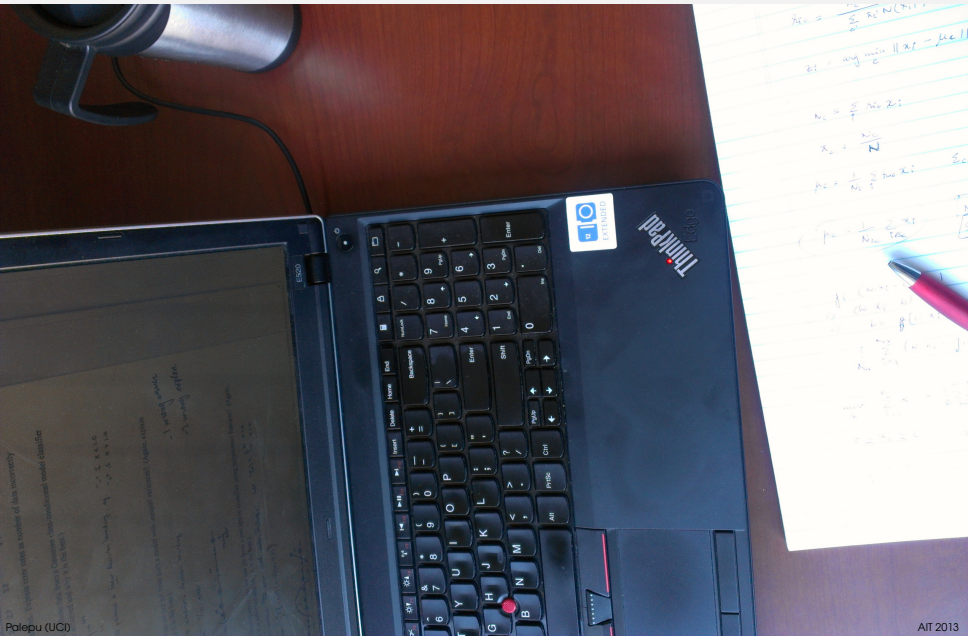


# Computer History Museum, Silicon Valley, CA





# It is Hard Work!



## It is Hard Work!

```

- class.forName(Owner).
  get Field(fldName). getObject
  (object);
object = new object;
// TODO - handle primitives and BREAK.
}

```

```

O { { Owner.fldName - Type } { Owner.fldName - Type

```

```

List = { 0,
         Owner.fldName - Type,
         Owner2.fldName2 - Type2 }

```

```

int length = list.size();
if (list.get(0) → number) {
object = objectarray [ list.get(0).intValue() ];
} else if (list.get(0).startsWith("#")) {
object = Class.forName(Owner0).get Field
} else { throw RuntimeException("line"); }
}

```

```

for (int i = 1; i < length; i += 1) {
String item = list.get(i);
String Owner = item.split("[.]")[0];
String fldName = item.split("[.]")[1];
String Type = item.split("[.]")[2].split

```

NOTICE

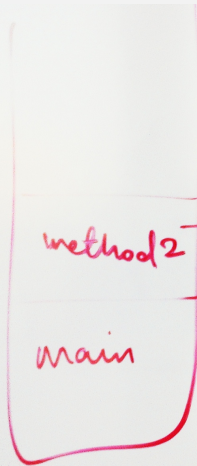


ese GROUP

Out Evidencal



# It is Hard Work!



1. enter flag. → define it.
2. Arguments → Store in argument.
3. Actual Types → if !zero argument
4. Dependencies.

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



## It is Hard Work!

PacMan

Tetris

Ant.

x Local Vars

x - const  
x - static

x Returns

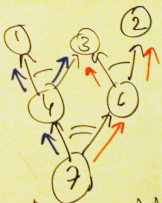
x Live

The persistent data in the memory model/datastruct. will bubble up. given that if it isn't we redefined often.

```

1  a = 1
2  b = 2
3  if (i == 0) {
4      c = a;
5  } else {
6      c = b;
7  }
8  print(c)

```



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

BreakPoint

TOOO (Sunday)  
SummariesNewsXML  
- Full  
- Simple  
- Commercial

Related Works  
- Abstract  
- Partial Section of  
- Analysis and  
- Implementation

Method Instance: ?

X Method  
X Jump  
Name  
→ Jump  
Vars  
→ Jump  
Arith  
Const

• Live is collected for for hoisting

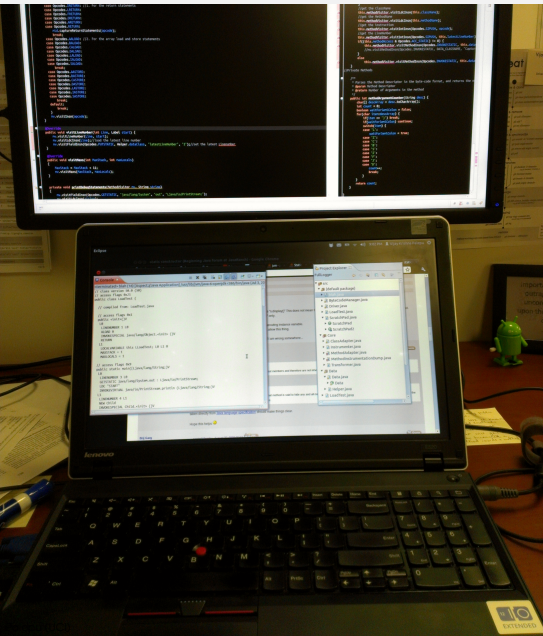
• Reflects to the label

- Node labels are not unique  
- Emphasize control analysis

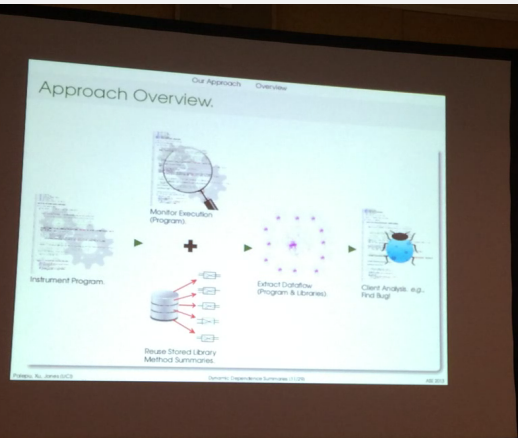
# It is Hard Work!

	deadline	notice
★ ICSE (conf)	Aug 17	Nov 27
ICST	Sept 17	Dec 14
★ ICSE (short)	Nov 2	Jan 31
ISSTA	Jan 25	May 6
★ ICPC	Feb 13/15?	Mar 23?
ASE	Feb 24/Mar 2?	June 18?
★ FSE	Mar 16?	June 18?
★ ICSE r.	Apr 15/20?	June 20?
ASE (conf)	May 3?	June 22?
★ FSE (conf)	June 23?	July 20?
★ FSE (short)	June 24?	Aug 20?

# It is Hard Work!




# It is Rewarding!



EXIT

# Keep in touch

A photograph of a computer monitor displaying a quote. In the foreground, there is a green Android robot figurine on the left, a brown stuffed animal in the center, and a yellow envelope on the right. The quote on the screen is partially obscured by the stuffed animal and the envelope.

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

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@vkrishnapalepu