

# Mutation

# Motation

# Mootation

# Mootation COW

# Mootation COW

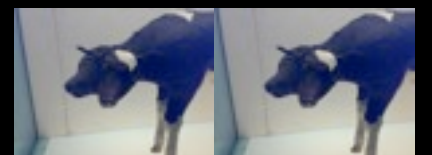
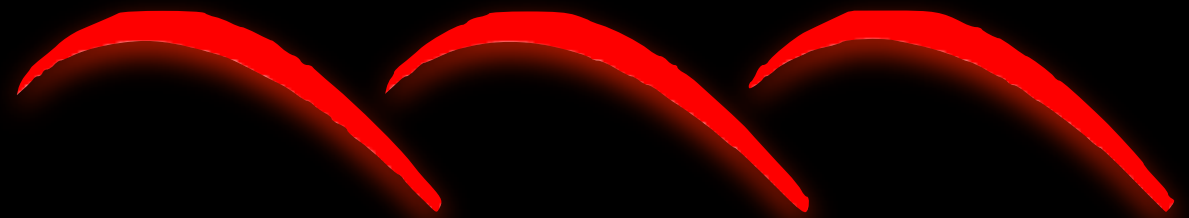
## CREST Open Workshop

# Mootation COW



# Centre for Research on Evolution Search and Testing Est. 2006

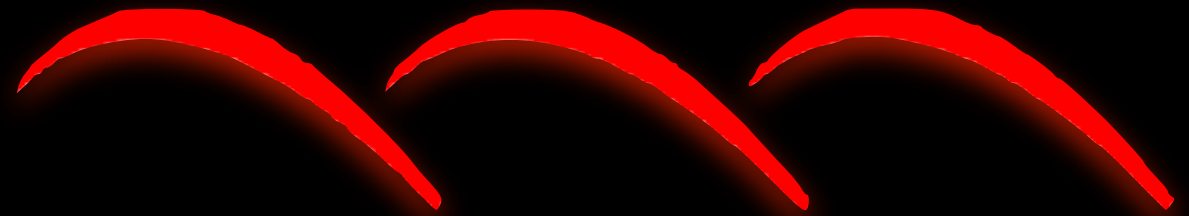
## CREST



# Centre for Research on Evolution Search and Testing Est. 2006

| admin

*CREST*



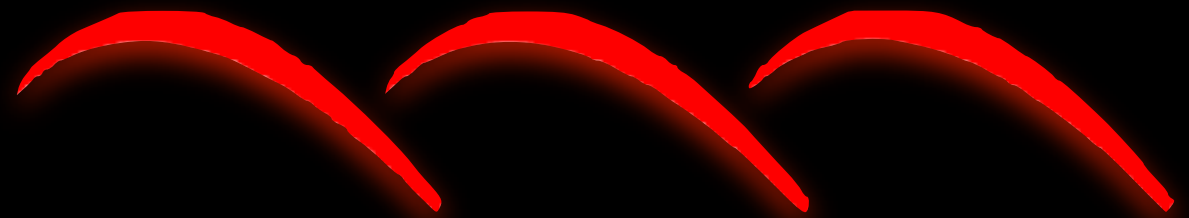


# Centre for Research on Evolution Search and Testing Est. 2006

1 admin

4 faculty

*CREST*



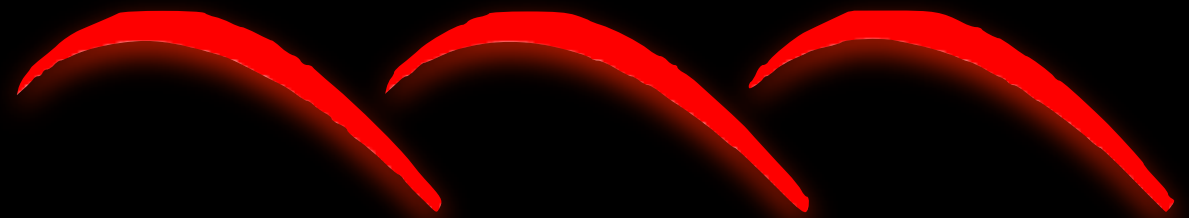
# Centre for Research on Evolution Search and Testing Est. 2006

1 admin

4 faculty

8 post docs

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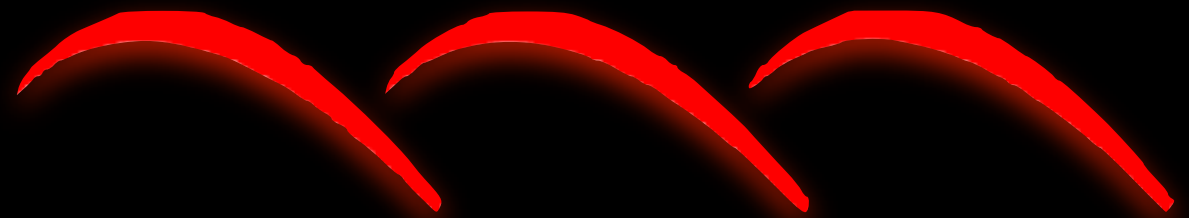
1 admin

4 faculty

8 post docs

11 PhD students

*CREST*



# Centre for Research on Evolution Search and Testing Est. 2006

1 admin

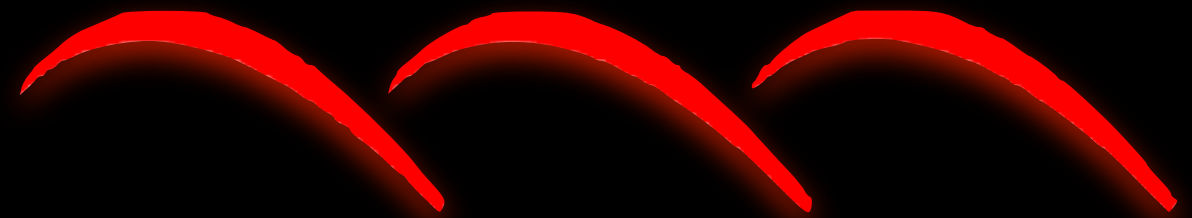
4 faculty

8 post docs

11 PhD students

1-4 resident visiting scholars

*CREST*



# Research

# Research

Service Oriented Computing

Search Based Software Engineering

Clone Detection

Dependence Analysis

Quantitative Information Flow

Digital Humanities

Testing

Requirement Engineering

# Research

Service Oriented Computing

Search Based Software Engineering

Clone Detection

Dependence Analysis

Quantitative Information Flow

Digital Humanities

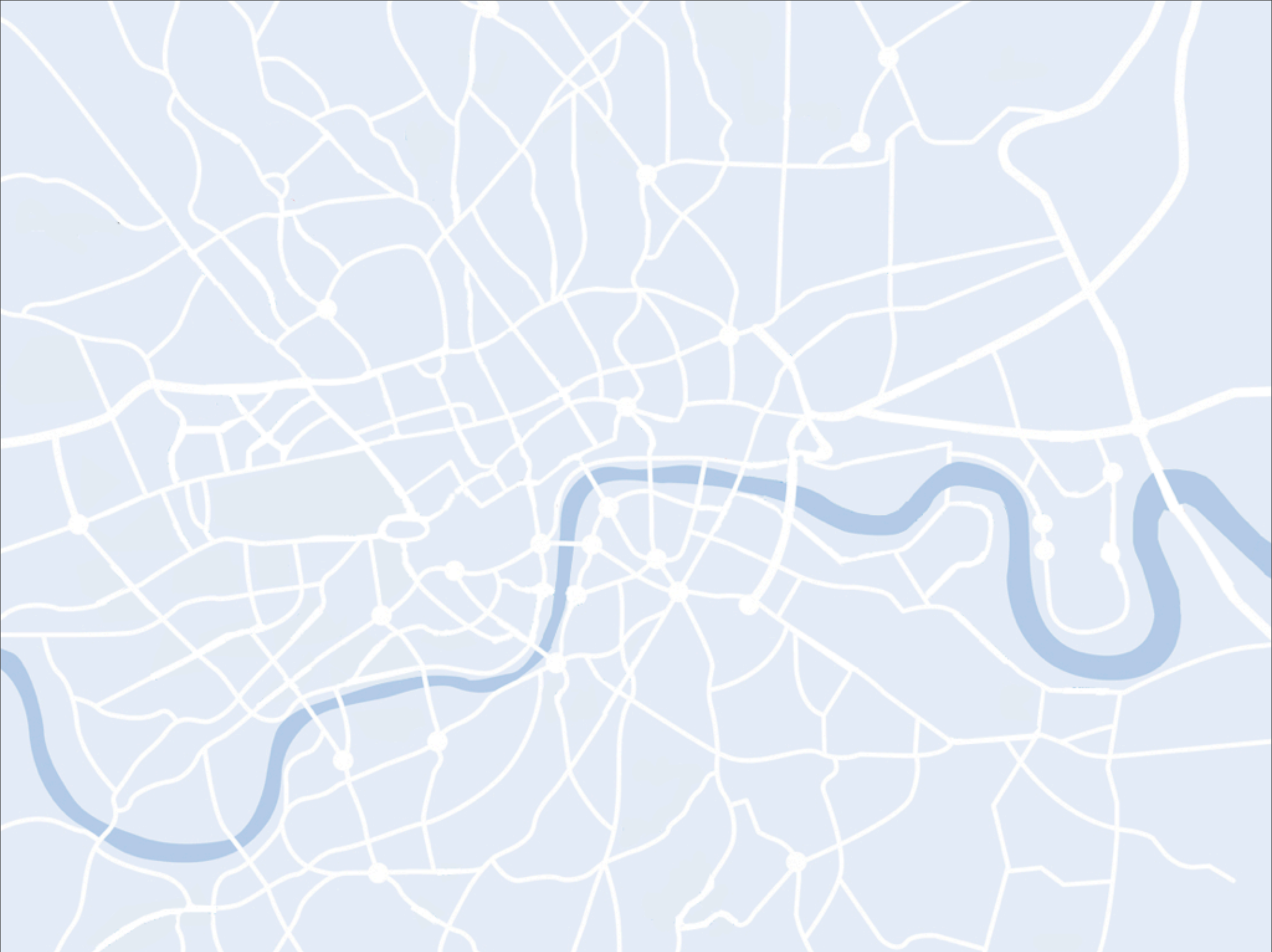
**Mutation Testing**

Requirement Engineering

# Funding









Mark Harman  
Mootation COW



# King's College London

KING'S  
*College*  
LONDON

Mark Harman  
Mootation COW



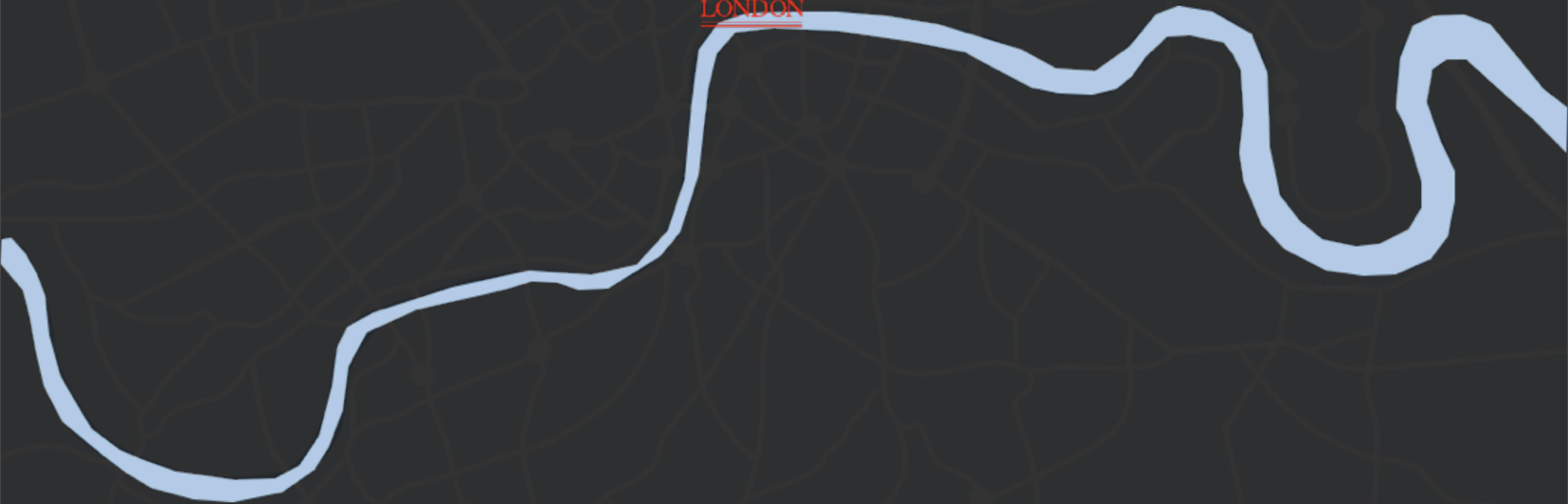
Monday, 31 January 2011



# University College London



KING'S  
*College*  
LONDON



Mark Harman  
Mootation COW



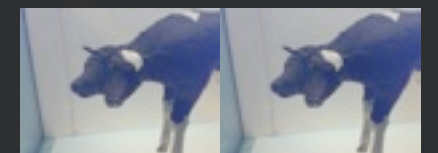
# University College London

## 20 mins walk



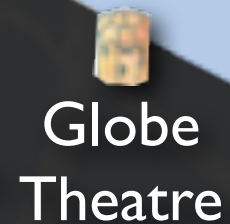
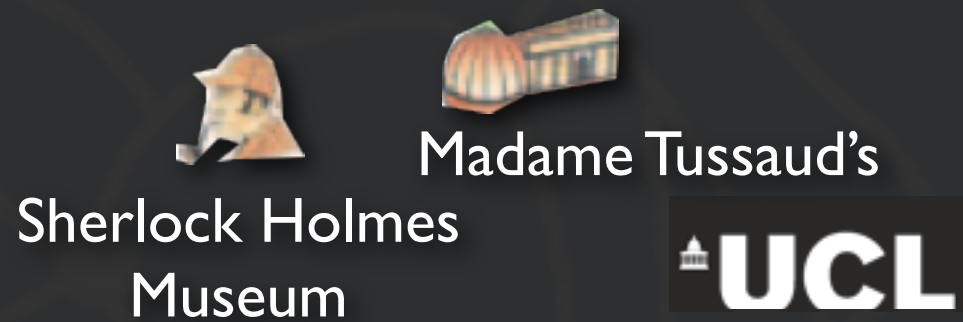
KING'S  
*College*  
LONDON

Mark H. ...man  
...otation COW



# University College London

## 20 mins walk



Mark H. ...  
...otation COW



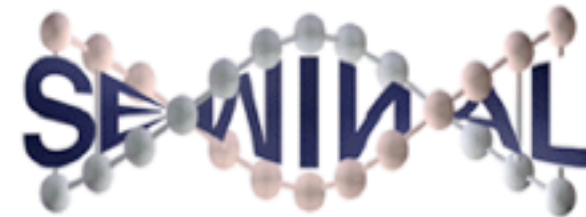


# Search Based Software Engineering

Apply **search techniques** to Software Engineering

## Multi objective optimisation:

- cost and value
- faults, coverage, time
- metric sets
- risk and reward



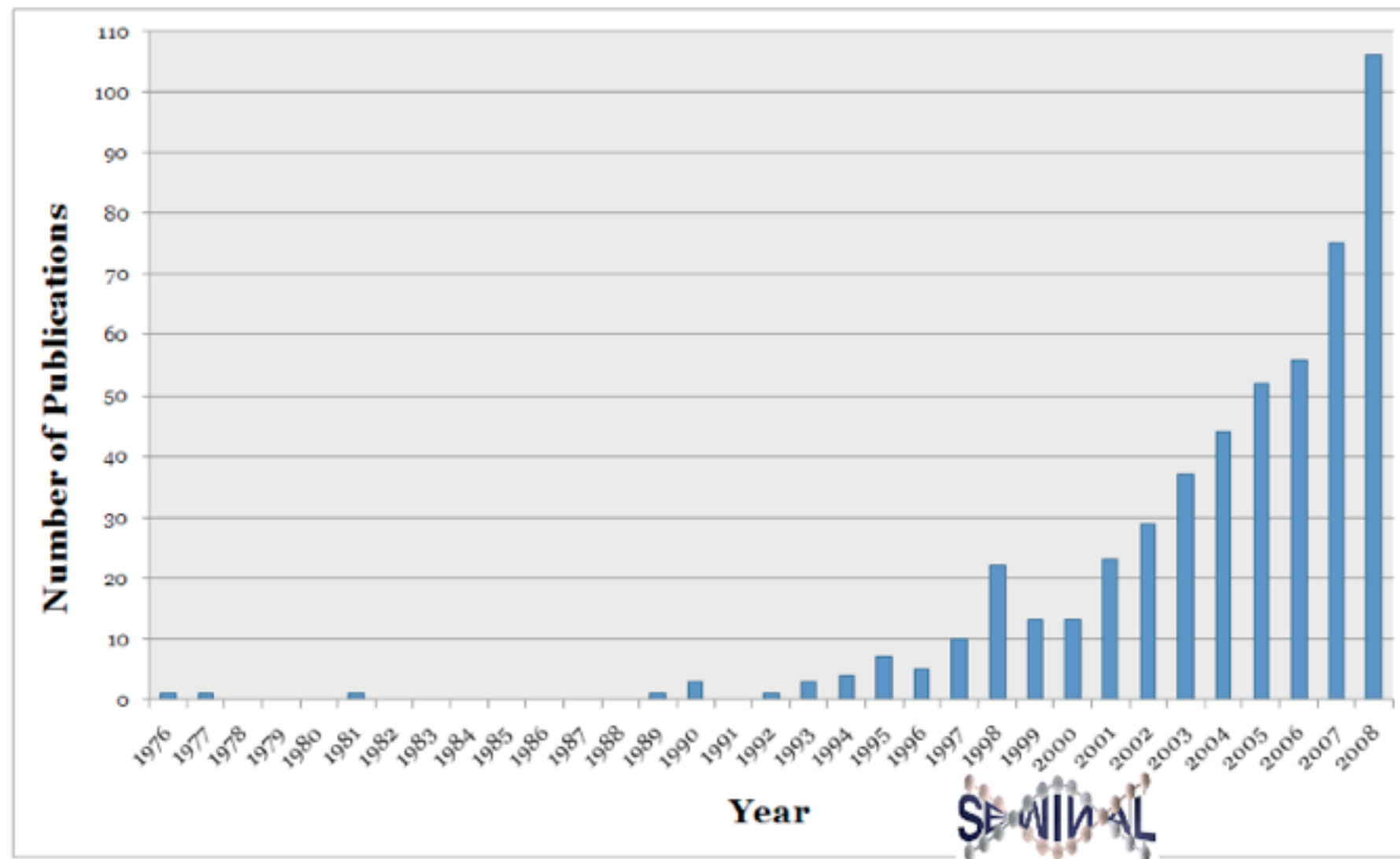
Centre for Research in  
Evolution, Search &

## Software Engineering Application areas:

- Requirements
- Testing
- Project Management
- Refactoring
- Source Code Analysis



# Search Based Software Engineering





# Testing, Testing, Testing

# Testing, Testing, Testing

Mutation testing

Model based testing

Automated test data generation

Web application testing

Service oriented testing

Fuzz testing

Security testing

# Testing, Testing, Testing

## Mutation testing

Model based testing

Automated test data generation

Web application testing

Service oriented testing

Fuzz testing

Security testing

# Dependence Analysis

dependence clusters

impact analysis

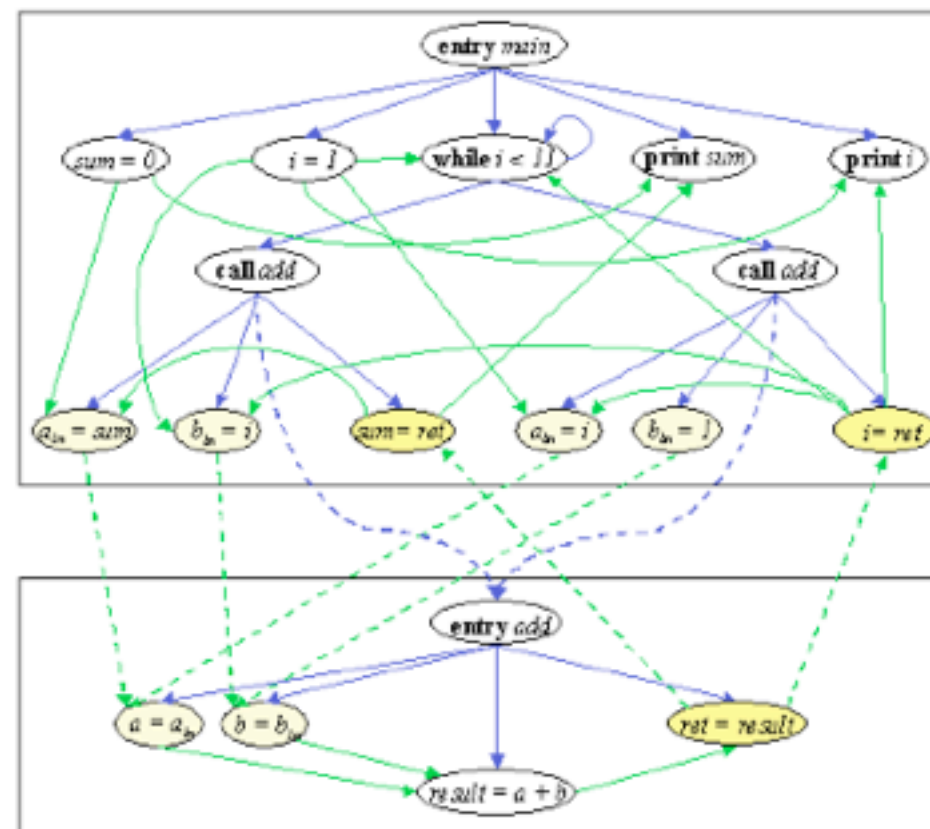
program and model based slicing

assessing third party code

SLIM

SLicing state based Models

ASTReNet



# Quantitative Information Flow

calculate amount of information flowing

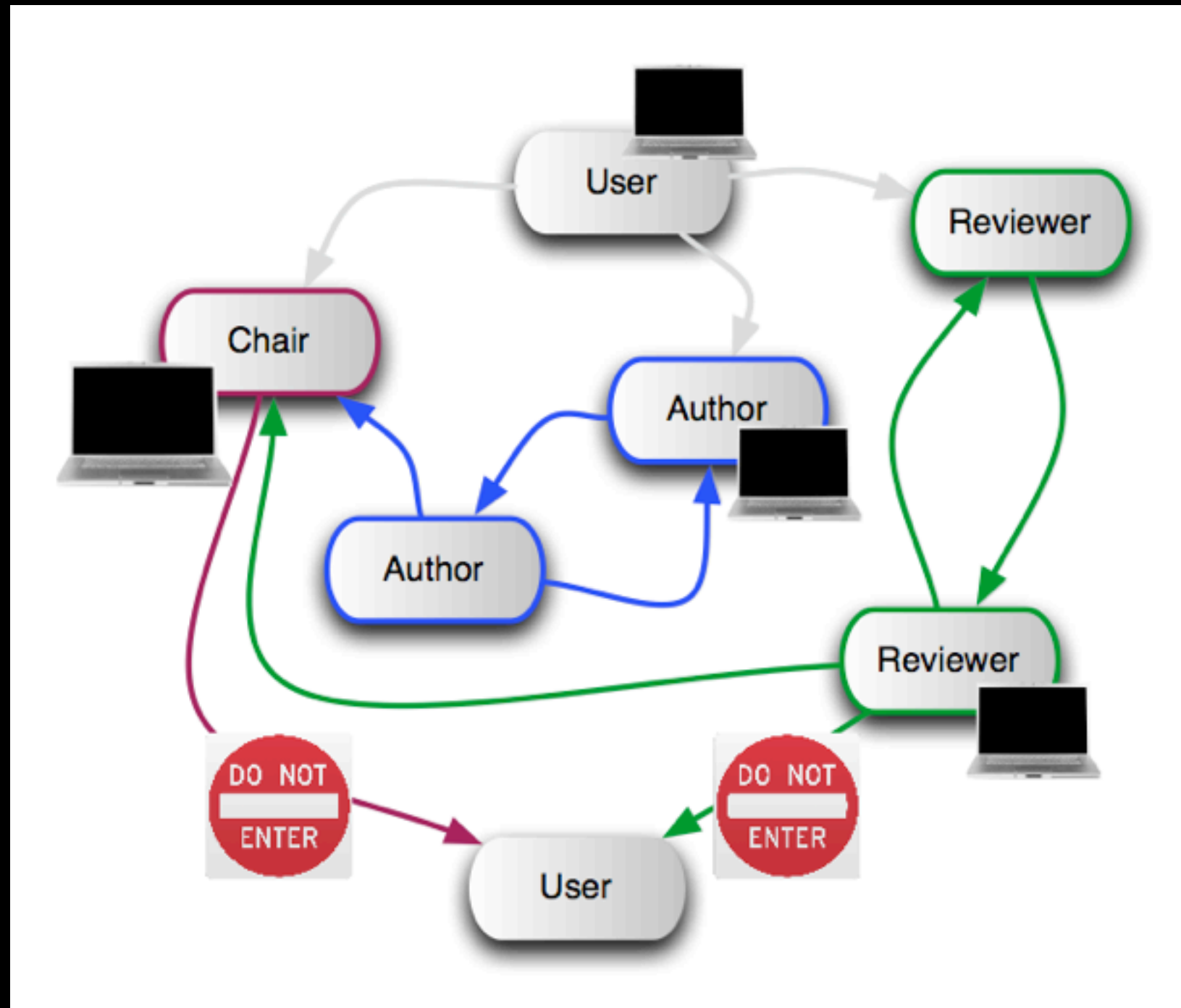
find security leaks

**Quantitative Information Flow**

An [EPSRC](#) funded research project based at three sites in London:



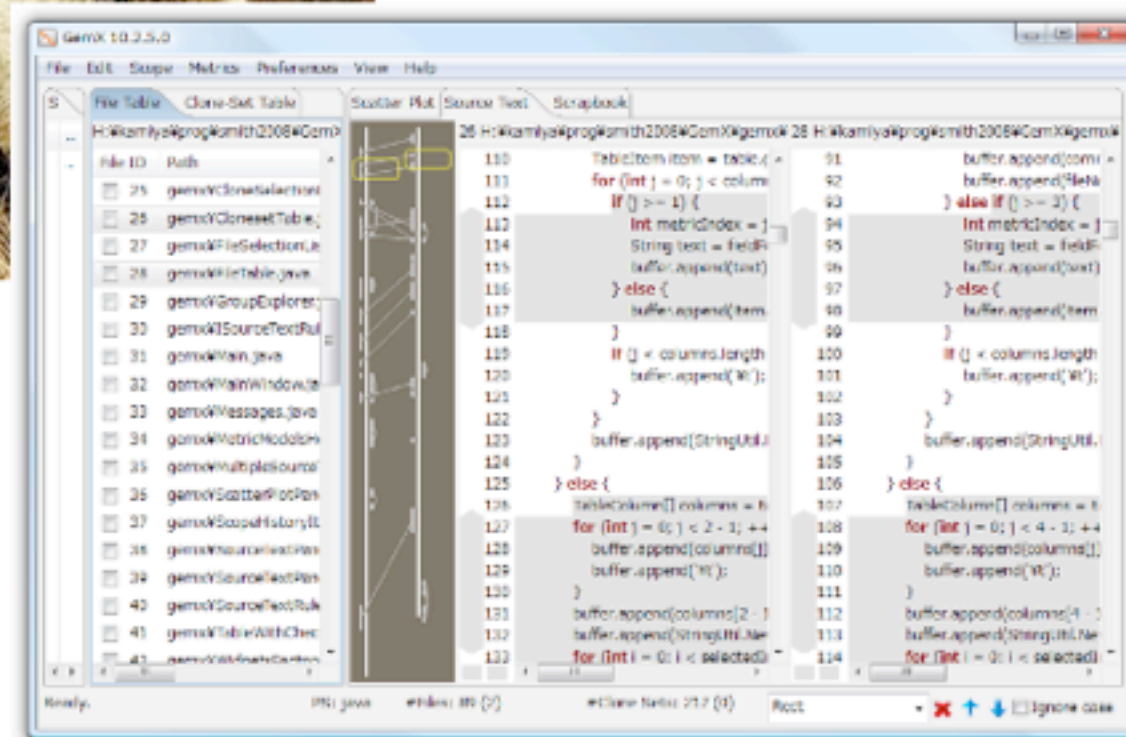
# Information Flow Control





# Clone Detection

using static analysis  
applied to code provenance  
applied to graphical languages



# Digital Humanities

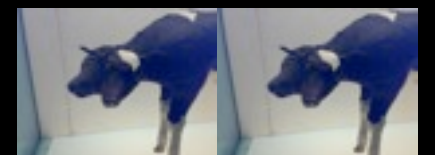
Mapping outwards from software to systems

Software Engineering Analysis translates to

- musicology
- archaeology

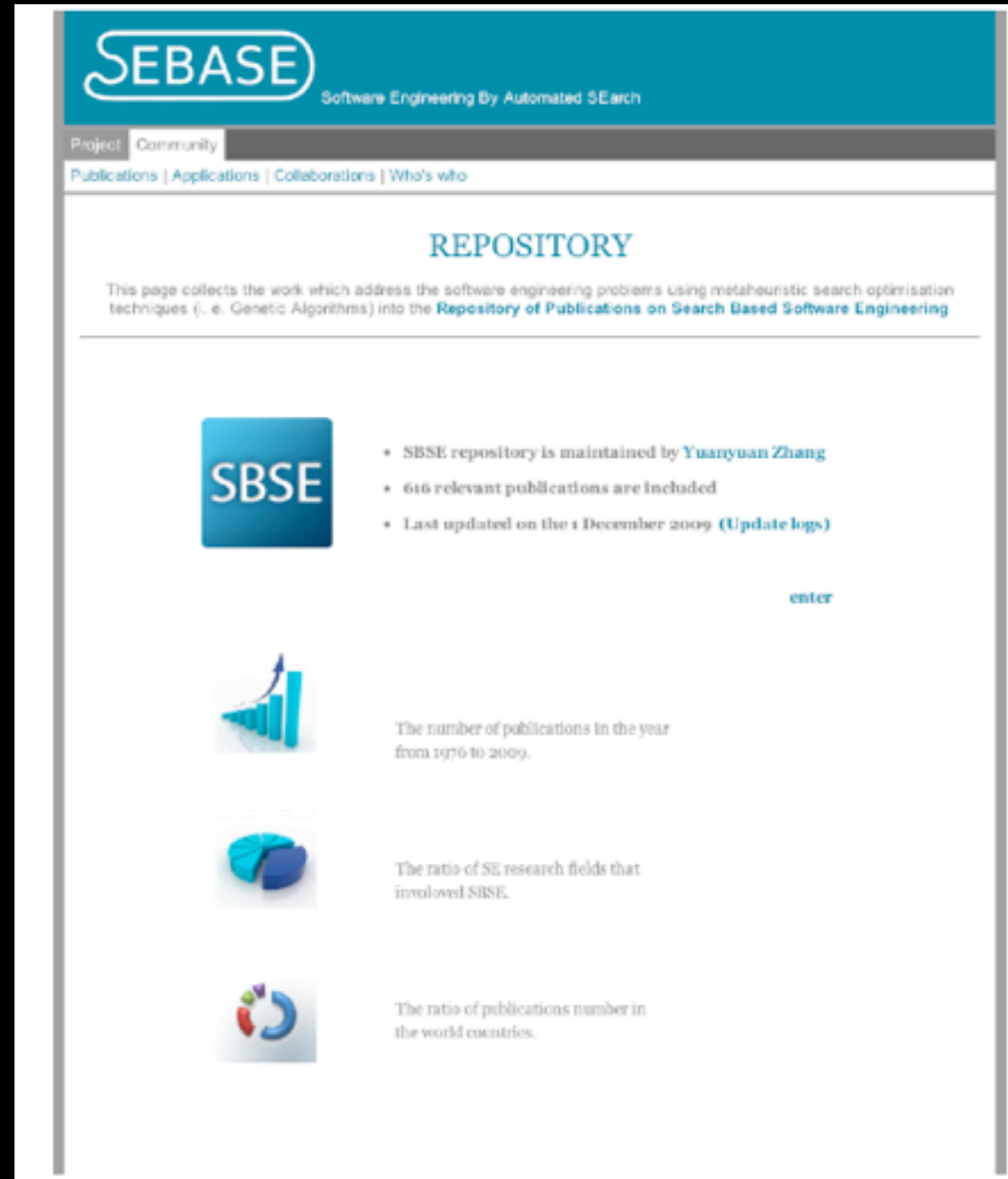


**PERSONAL-TOUCH**





# SBSE Repository



The screenshot shows the SEBASE website with a teal header. The main content area is titled 'REPOSITORY' and describes the collection of software engineering problems using metaheuristic search optimization techniques. It includes a list of statistics and a search bar.


**SEBASE** Software Engineering By Automated SEarch

Project Community


Publications | Applications | Collaborations | Who's who

## REPOSITORY


This page collects the work which address the software engineering problems using metaheuristic search optimisation techniques (i. e. Genetic Algorithms) into the [Repository of Publications on Search Based Software Engineering](#)




- SBSE repository is maintained by [Yuanyuan Zhang](#)
- 616 relevant publications are included
- Last updated on the 1 December 2009 ([Update logs](#))



The number of publications in the year from 1976 to 2009.




The ratio of SE research fields that involved SBSE.



The ratio of publications number in the world countries.

Mark Harman  
Mootation COW



The footer contains the UCL logo, which includes a building icon and the letters 'UCL'. To the right of the logo are two small, side-by-side images of a cow.

Monday, 31 January 2011

# GP Bibliography



bibliography

## The Genetic Programming Bibliography

[ [Search It](#) | [Most recent](#) | [Top 10 Cited](#) | [Most Downloaded](#) | [Add to It](#) ]

The bibliography is part of the [Collection of Computer Science Bibliographies](#).  
It is maintained and managed by [William Langdon](#), [Steven Gustafson](#), and [John Koza](#).



[Add single entries](#) or email [William Langdon](#) or firstname DOT lastname AT-SYMBOL research DOT ge DOT com  
a bibtex file containing the entries.

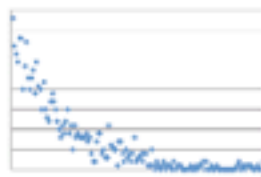
### Bibtex file

[gp-bibliography.bib \(Compressed\)](#) Over 6000 GP references

### Other formats

[refer format \(Compressed\)](#)

[text file \(Compressed\)](#)



[Author](#) format (split by first author)



[co authorship graphs](#)

### Search Interfaces

The GP bibliography is one of the many online computer science bibliographies

There are several on line search tools for these bibliographies. For example:

- o [WWW form](#) based search

- o The [coauthor graphs](#) can also be used for searching by author name.

- o You can find all entries for an author using a URL like this one: <http://www.cs.bham.ac.uk/~wbl/biblio/gp-html/WilliamBLangdon.html>

Naturally you must replace **WilliamBLangdon.html** by the author's name.

### Other Resources

- o [Bibliographies of evolutionary computation conferences](#).

- o [Hints](#) on using bibliographies with PC based word processing packages

- o [Links](#) to other information on bibliographies.

- o [Subdirectory](#) containing some [tools](#) and [templates](#) for maintaining bibliographies.

- o [Links](#) to other bibliographies.

- o [Home pages](#) of some GP researchers




# Mutation Testing Repository

[HOME](#) [REPOSITORY](#) [THEORY](#) [TECHNIQUES](#) [ANALYSIS](#)

[PUBLICATION](#) [EMPIRICAL STUDY](#) [TOOL](#)

## Mutation Testing Repository

Publications on Mutation Testing



Mutation Testing remains an active research area with growing interest...

[READ MORE](#)

### Repository News

Welcome to Mutation Testing repository

Mutation Testing is a fault-based software testing technique that has been widely studied for over three decades. The literature on mutation testing has contributed a set of approaches, tools and empirical studies. This repository aims to provide a full coverage of the publications in the literature on Mutation Testing.

#### Mutation Testing Survey

Using this repository, a comprehensive analysis and survey of Mutation Testing work has been conducted. The paper presents the results of several development trend analyses. These analyses provide evidence that mutation testing techniques and tools are reaching a state of maturity and applicability, while the topic of mutation testing itself is the subject of increasing interest. This paper is currently published as a technical report, available from [here](#). If you want to cite results from the survey, here is the BibTeX entry:

```
@ARTICLE{Jia10,  
  author = {Yue Jia and Mark Harman},  
  title = {(A)n (A)nalysis and (S)urvey of the (D)evelopment of (M)utation (T)esting},  
  journal = {IEEE Transactions on Software Engineering},  
  year = {2010},  
  volume = {To appear},  
  number = {},  
  pages = {}  
}
```

### Quick Search

Search for ☒ paper ☐ author

  
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### Repository Status

Last update: 16/06/10  
Number of Papers: 415  
Number of Authors: 298  
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### Missing Paper?

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### Links

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  volume = {To appear},  
  number = {},  
  pages = {}  
}
```

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Search for ☒ paper ☐ author

  
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# COWs

CREST Open Workshop

Typically last week of the month

Aim for last Wednesday (where rooms available)

Discussion based

Recorded and archived



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# Previous COWs



# Previous COWs

**Nov 09: Search Based Software Engineering**

**Dec 09: Software Testing**

**Jan 10: Using Static Analysis for Fault Prediction**

**Feb 10: Operational Research for Software Engineering Methods**

**Mar 10: Information Theory for Search Based software Engineering**

**Apr 10: Dependence Analysis and Slicing for Programs and Models**

**May 10: Information Flow and Security**

# Upcoming COWs

## **9th CREST Open Workshop**

### **Code Provenance and Clone Detection**

Date: Tue 23 Nov, 2010

Venue: Lethaby Room, Mary Ward House

## **10th CREST Open Workshop**

### **Program Analysis and Slicing**

Date: 24 - 25 Jan, 2011

Venue: William Goodenough Room, Goodenough Club

## **11th CREST Open Workshop**

### **SBSE for Early Lifecycle Software Engineering: Requirements and Management**

Date: Wed 23 Feb, 2011

Venue: Engineering Front Executive Suite, Roberts Building

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# Thanks

Jian Ren, COW Programme manager

Lena Hierl, Administrative arrangements

Yue Jia, visitor liaison

EPSRC, funding

Attendees and speakers

# Thanks

Jian Ren, COW Programme manager

Lena Hierl, Administrative arrangements

Yue Jia, visitor liaison

EPSRC, funding

Attendees and speakers

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Jian Ren, COW Programme manager

**Lena Hierl, Administrative arrangements**

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Jian Ren, COW Programme manager

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Attendees and speakers

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Jian Ren, COW Programme manager

Lena Hierl, Administrative arrangements

Yue Jia, visitor liaison

EPSRC, funding

**Attendees and speakers**

# Domestics

Fire or other alarm

Toilets

Discussions

# Domestics

Fire or other alarm

Toilets

Discussions

# *Introductions ...*