# Mutation

Mark Harman
Mootation COW

# Motation

# Mootation

Mark Harman
Mootation COW

# Mootation COW

# Mootation COW CREST Open Workshop

Mark Harman
Mootation COW

# Mootation COW

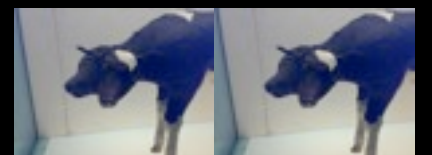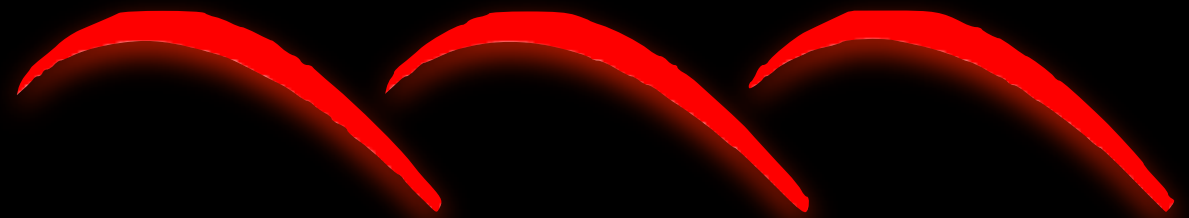# Centre for Research on Evolution Search and Testing *Est. 2006*
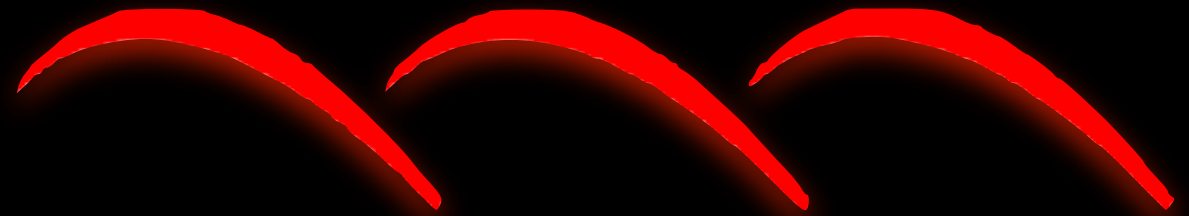
*CREST*

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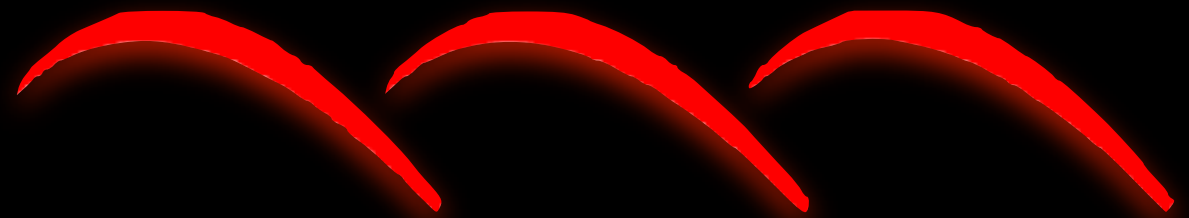
I   admin

*CREST*

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

1 admin
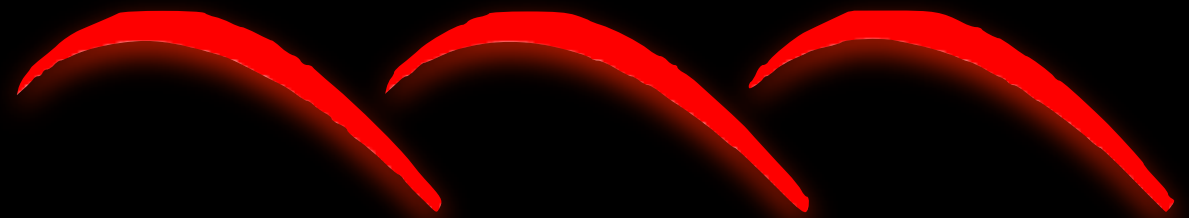
4 faculty

*CREST*

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

1    admin

4    faculty

8    post docs

*CREST*

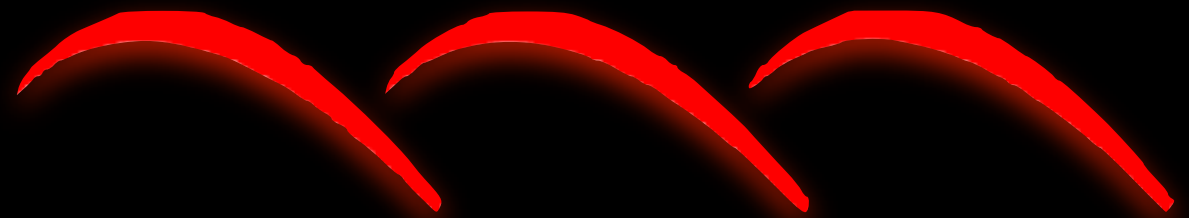# Centre for Research on Evolution Search and Testing *Est. 2006*

1   admin
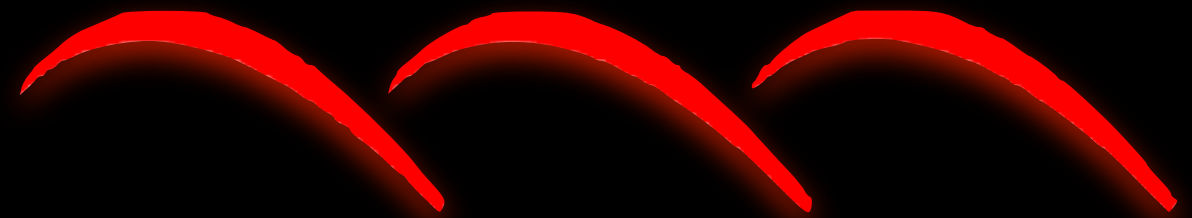
4   faculty

8   post docs

11   PhD students

*CREST*

# **C**entre for **R**esearch on **E**volution **S**earch and **T**esting *Est. 2006*

1 admin

4 faculty

8 post docs

11 PhD students

1-4 resident visiting scholars

*CREST*

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# Research

# Research

Service Oriented Computing

Search Based Software Engineering          Clone Detection

Dependence Analysis          Quantitative Information Flow
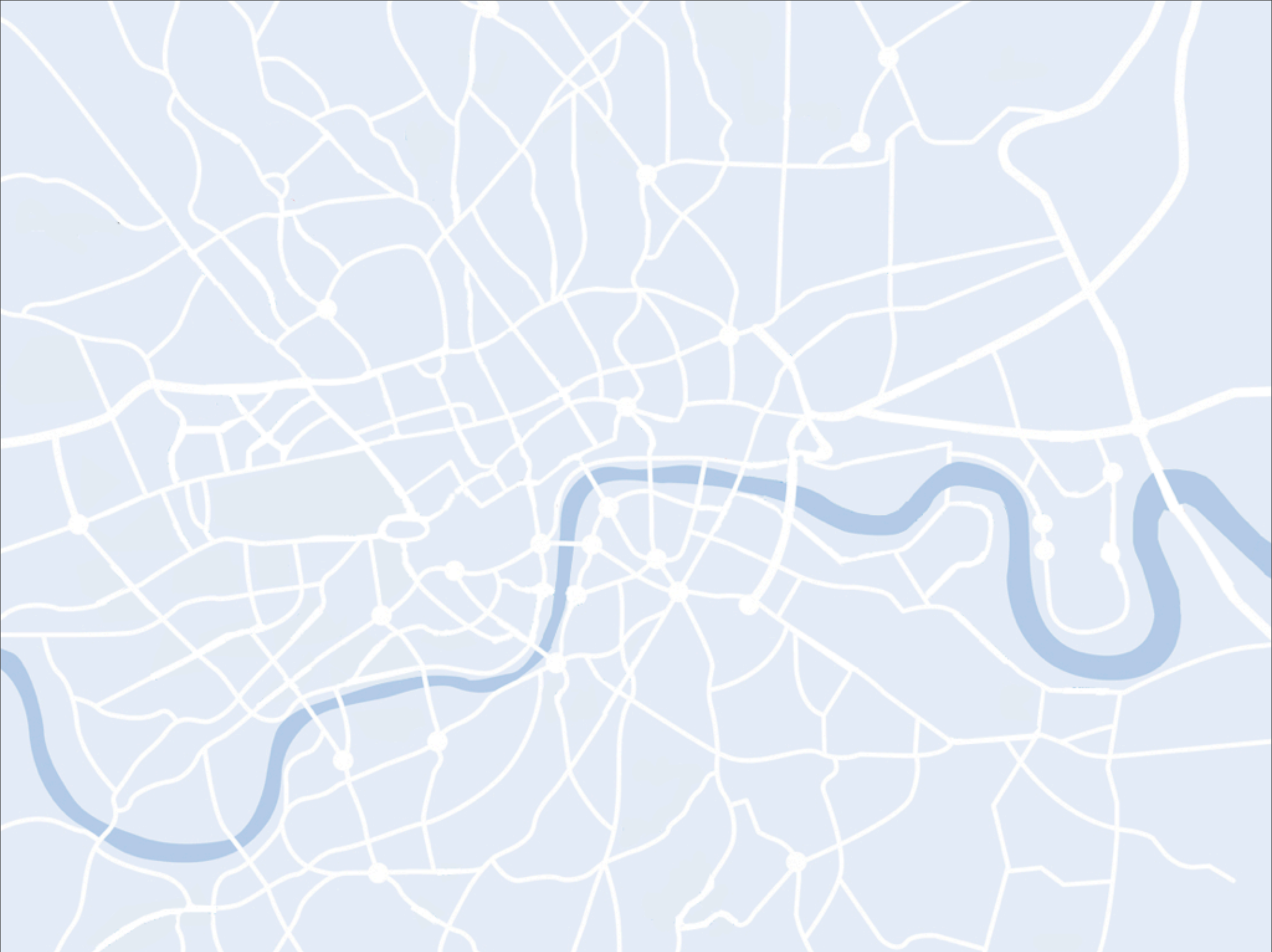
Digital Humanities          Testing

Requirement Engineering

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# Research

Service Oriented Computing

Search Based Software Engineering          Clone Detection

Dependence Analysis          Quantitative Information Flow

Digital Humanities          Mutation Testing

Requirement Engineering

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# Funding

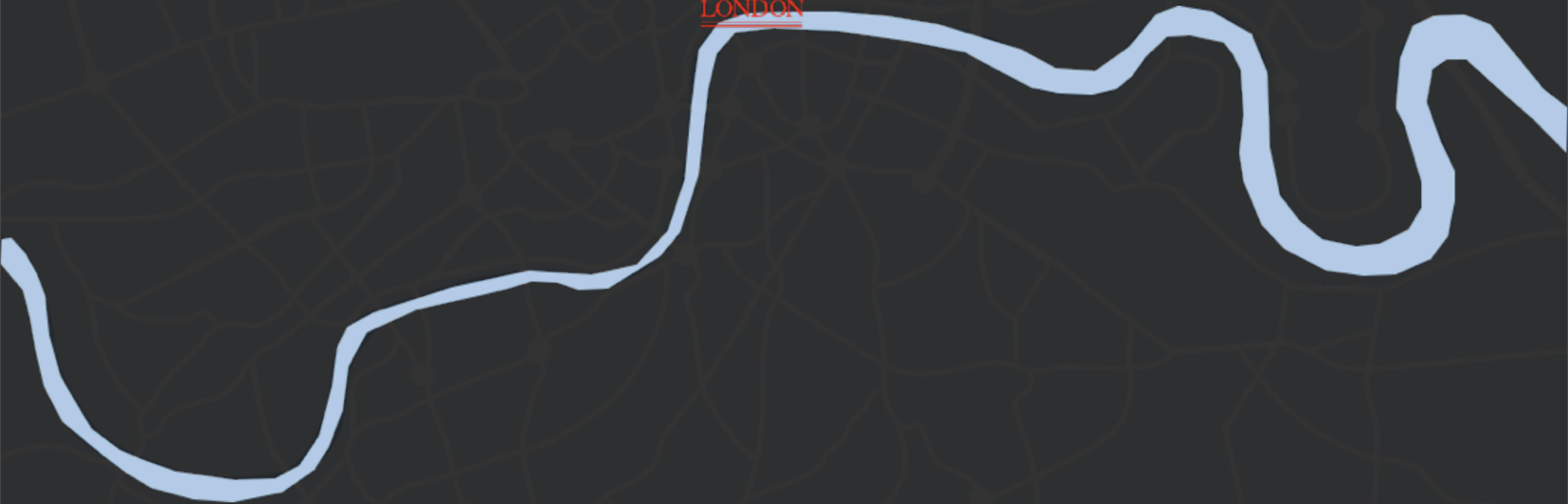Mark Harman
Mootation COW

Monday, 31 January 2011

Mark Harman
Mootation COW

Monday, 31 January 2011

# King's College London

King's College London

Mark Harman
Mootation COW

University College London

**UCL**

KING'S College LONDON

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Monday, 31 January 2011

University College London
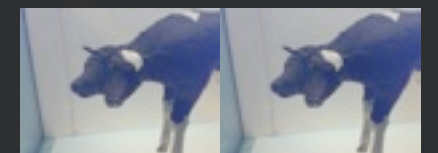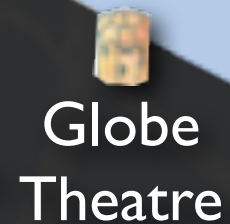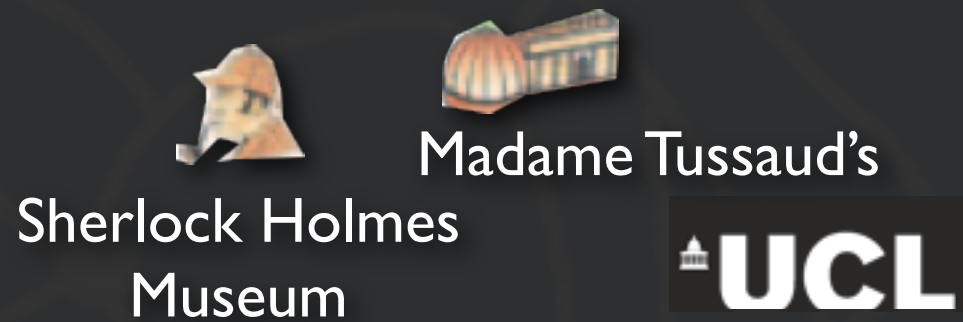20 mins walk

King's College London

Mark Herman
Quotation COW

Sherlock Holmes Museum

Madame Tussaud's

UCL

University College London
20 mins walk

British Museum

Marble Arch

Eros

Nelson's Column

National Gallery

King's College London

Covent Garden Market

Royal Courts of Justice

St. Paul's

Westminster Abbey

House of Parliament

London Eye

Tate Modern

Globe Theatre

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

UCL

Monday, 31 January 2011

# Search Based Software Engineering



Apply **search techniques** to Software Engineering

**Multi objective optimisation:**
- cost and value
- faults, coverage, time
- metric sets
- risk and reward

SEMINAL
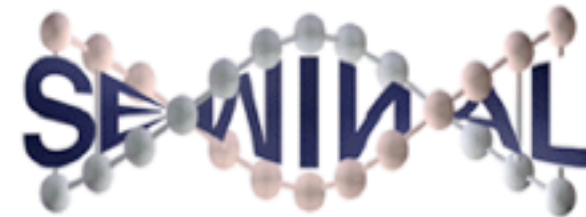
Centre for Research in Evolution, Search &

**Software Engineering Application areas:**
- Requirements
- Testing
- Project Management
- Refactoring
- Source Code Analysis

SEBASE
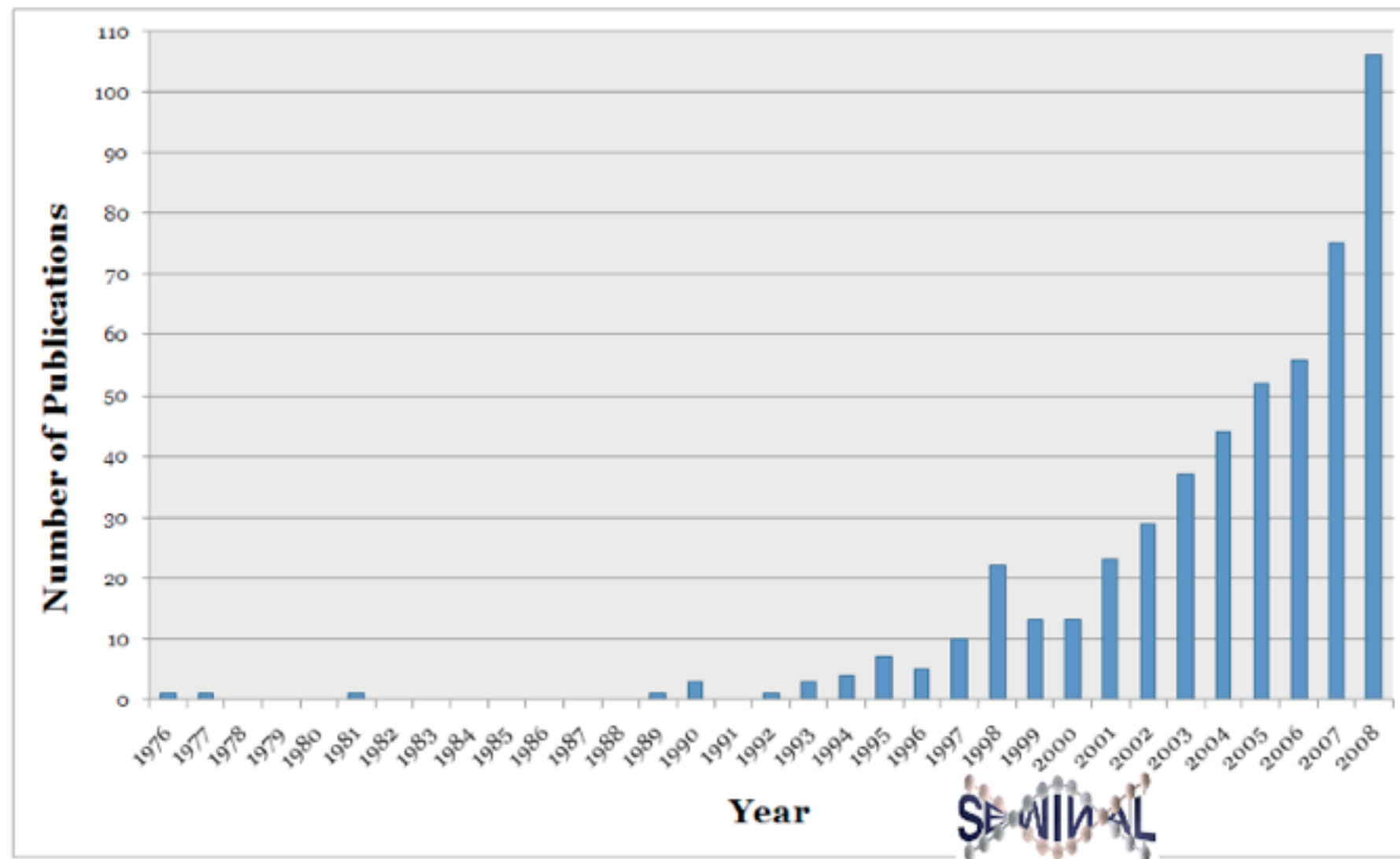
EvoTest

FITTEST

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UCL

# Search Based Software Engineering

# Testing, Testing, Testing

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# Testing, Testing, Testing

Mutation testing
Model based testing
Automated test data generation
Web application testing
Service oriented testing
Fuzz testing
Security testing

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# Testing, Testing, Testing

**Mutation testing**
Model based testing
Automated test data generation
Web application testing
Service oriented testing
Fuzz testing
Security testing

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# Dependence Analysis



dependence clusters

impact analysis

program and model based slicing

assessing third party code

SLIM
SLIcing state based Models

ASTReNet

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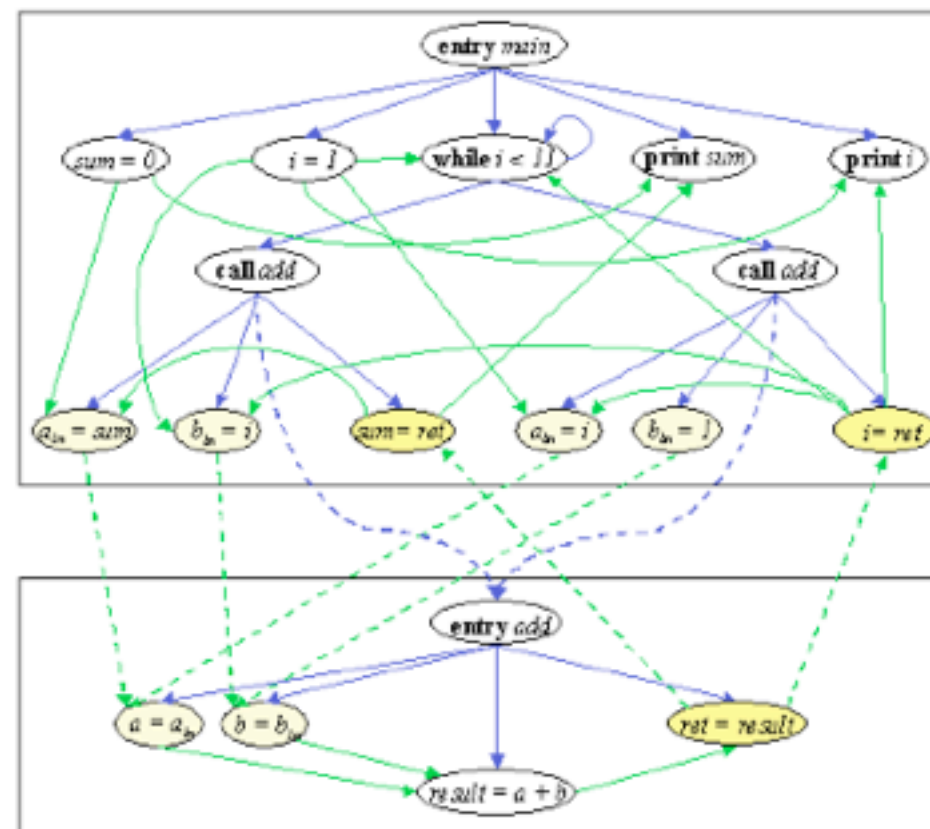
# Quantitative Information Flow



**calculate** amount of information flowing

**find security leaks**

**Quantitative Information Flow**

An EPSRC funded research project based at three sites in London:

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# Information Flow Control
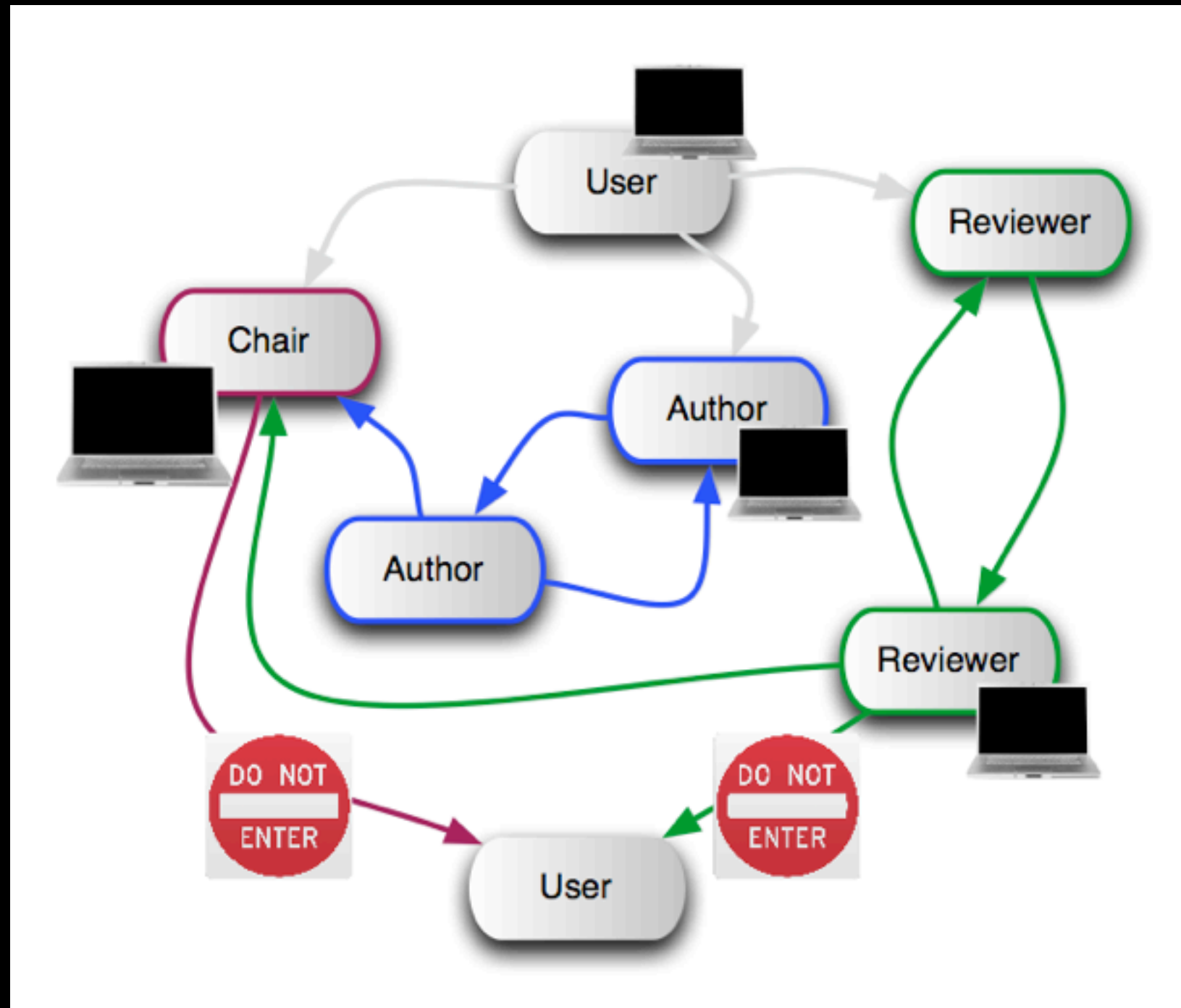
# Clone Detection



using static analysis
applied to code provenance
applied to graphical languages
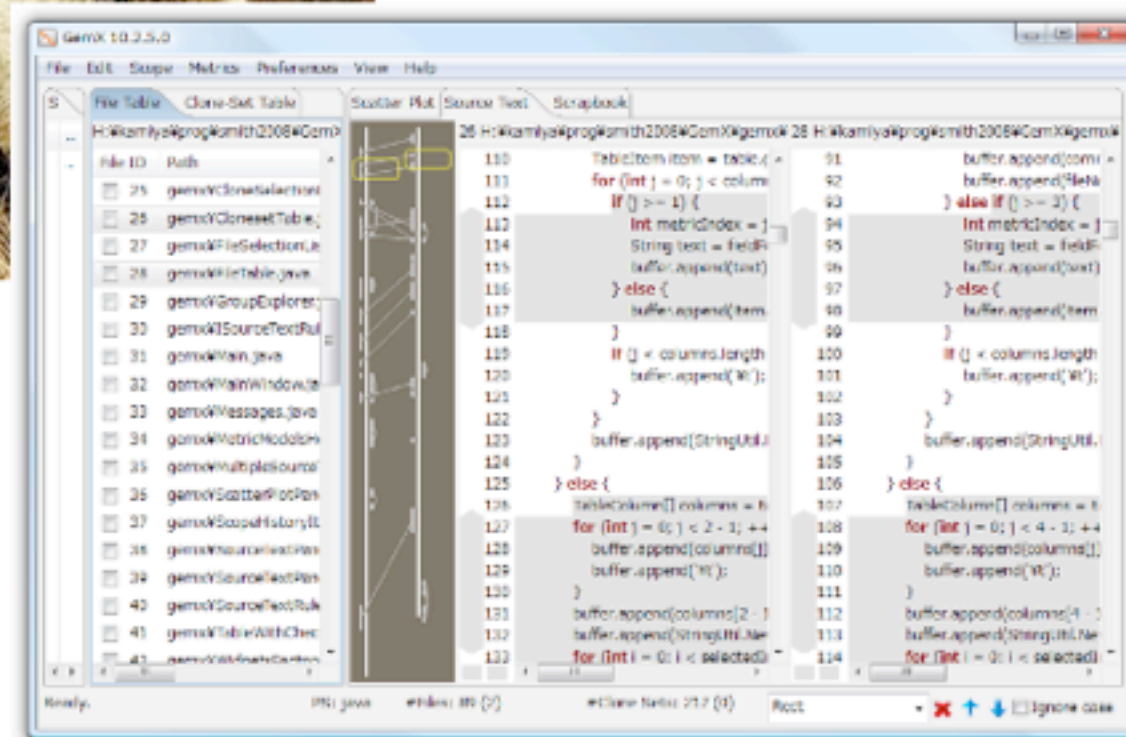
# Digital Humanities

Mapping outwards from software to systems

Software Engineering Analysis translates to

- musicology
- archaeology

PERSONAL-TOUCH

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# SBSE Repository

# GP Bibliography

# Mutation Testing Repository

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# Mutation Testing Repository

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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**

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# 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 Lifecyle 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

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**Attendees and speakers**

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# Domestics

Fire or other alarm

Toilets

Discussions

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# Domestics

Fire or other alarm

Toilets

Discussions

# *Introductions ...*

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