

Genetic Improvement

COW45

25-26 January 2016

Welcome

Justyna Petke & John Woodward



Sherlock Holmes
Museum

Madame Tussaud's

wellcome
collection

UCL
British
Museum

20 mins walk

Marble Arch

Eros

National
Gallery

Nelson's
Column

Covent
Garden
Market

Royal Courts
of Justice

St. Paul's

Westminster
Abbey

House of Parliament

London Eye

Tate Modern
Globe
Theatre

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

CREST

1 admin

7 faculty

5 post docs

16 PhD students

1-4 resident visiting scholars



Academic Staff

Earl Barr
David Clark
Jens Krinke
Mark Harman (Head of Group)
Nicolas Gold
Paolo Tonella (Honorary)
Yue Jia

Research Staff

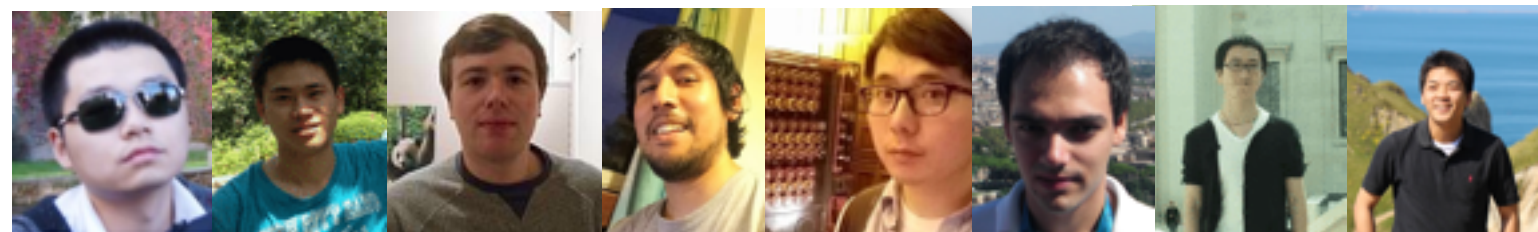
Bill Langdon
Federica Sarro
Hector D Menendez
Justyna Petke
Yuanyuan Zhang

Admin Staff

Katie Bourke

Research Students

Afnan A. Al-Subaihin
Alexandru Marginean
Bobby Bruce
Carlos Gavidia
Chaiyong Ragkhitwetsagul
DongGyun Han
Fan Wu
Gunel Jahangirova
Ke Mao
Leonid Joffe
Lingbo Li
Matheus Henrique Esteves Paixao
Siti Faizah Omar
Steve Dodier-Lazaro
William Martin
Zheng Gao



<http://crest.cs.ucl.ac.uk/people/>

Research

App Store Analysis

Search Based Software Engineering

Clone Detection

Dependence Analysis

Quantitative Information Flow

Requirements Engineering

Testing

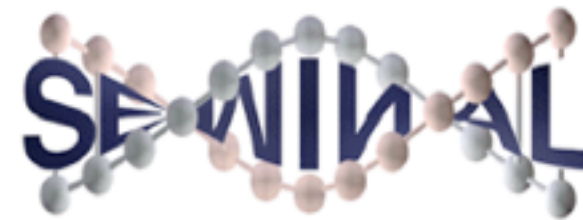
Digital Humanities

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



Testing, Testing, Testing

Web application testing

Security testing

Numeric computation testing

Regression testing

Mutation testing

Requirements based testing

Test data generation

Dependence Analysis

dependence clusters

impact analysis

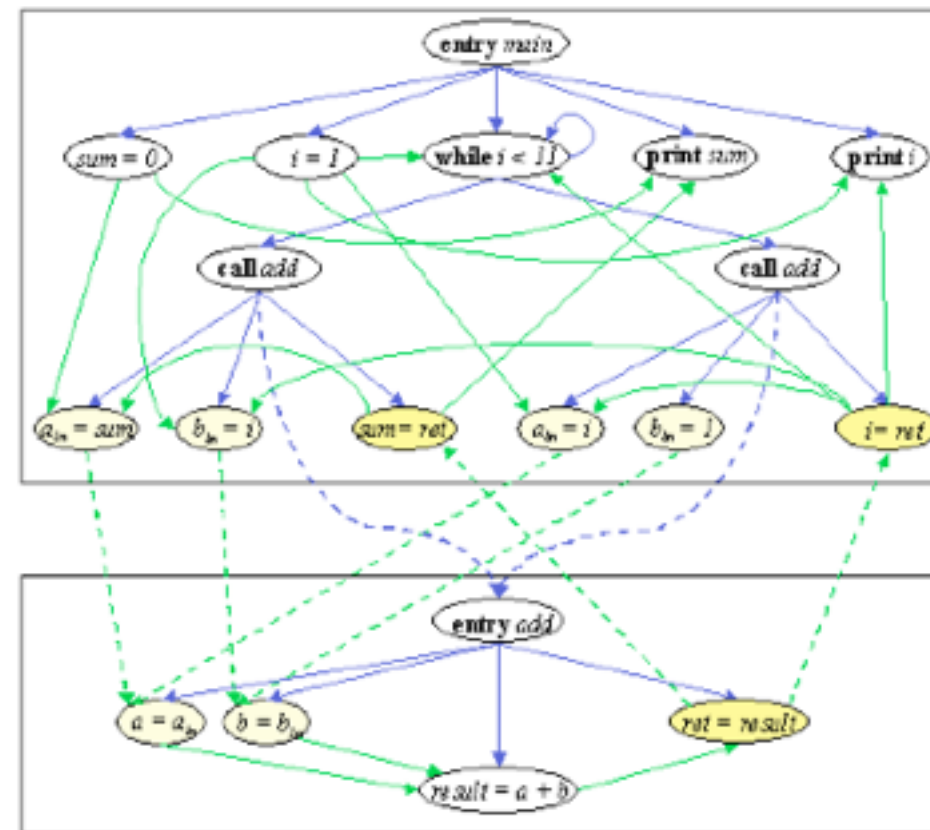
program and model based slicing

assessing third party code

SLIM

SLicing state based Models

ASTReNet



Quantitative Information Flow

calculate amount of information flowing

find security leaks

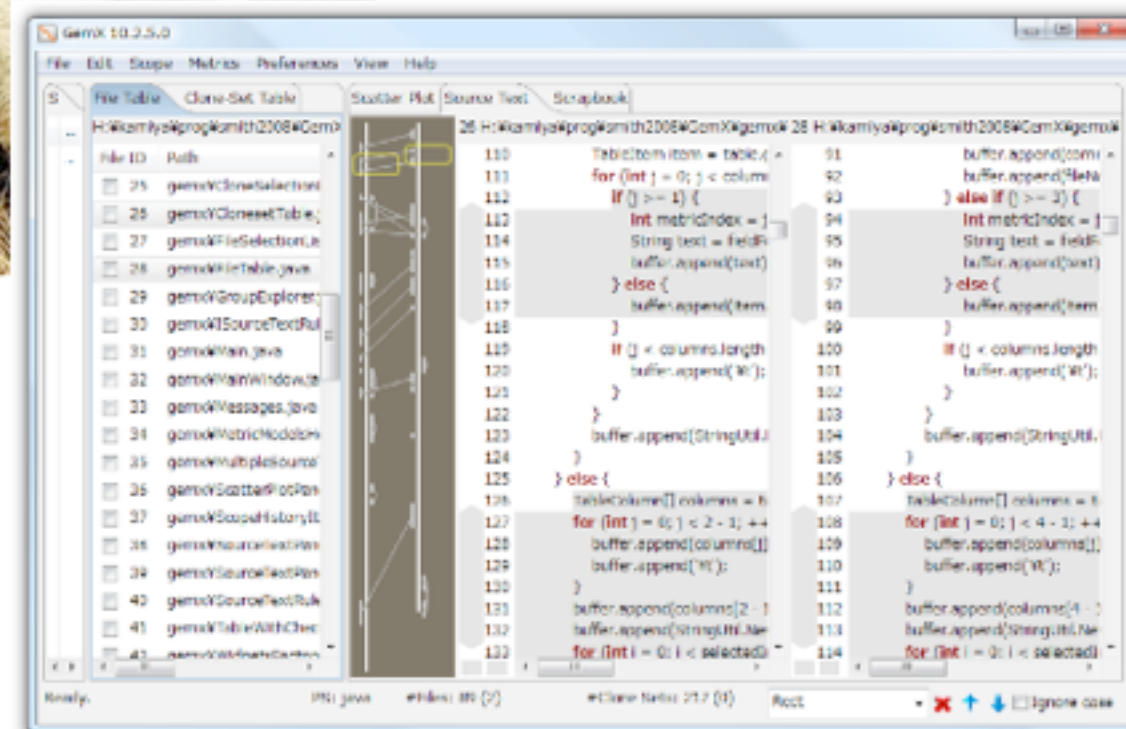
Quantitative Information Flow

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



Clone Detection

using static analysis
applied to code provenance
applied to graphical languages



App Store Analysis and Mining

User Rating does matter (MSR 2012)

Sampling bias issues (MSR 2015)

Feature Migration (RE 2015)

Predictive models

Android Test Data Generation System

App Developer Interview and Survey

Energy Optimisation



UCL App Store Analysis Group

<http://www0.cs.ucl.ac.uk/staff/F.Sarro/projects/UCLappa/home.html>

Digital Humanities/Arts

Mapping outwards from software to systems
Software Engineering Analysis translates to

- musicology
- archaeology



PERSONAL-TOUCH

Three Repositories

SBSE Repository

SBSE 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](#)
- 916 relevant publications are included
- Last updated on the 25 July 2011 ([Update logs](#))



[enter](#)

The number of publications in the year from 1976 to 2011.



The ratio of SE research fields that involved SBSE.



The ratio of publications number in the world countries.

Who's Who



This page designed and maintained by : [Dr. Yuanyuan Zhang](#)

GP 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 D0T lastname AT-SYMBOL research D0T ge D0T com
a bibtex file containing the entries.

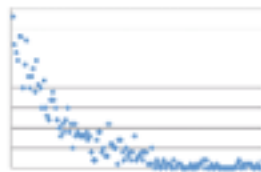
Bibtex file

[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

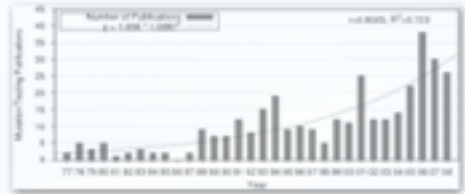
Mutation Testing Repository

[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{JiaM10,  
  author = {Yue Jia and Mark Haman},  
  title = {(A)n (A)nalysis and (S)urvey of the (D)evelopment of (M)utation (T)esting},  
  journal = {IEEE Transactions of Software Engineering},  
  year = {2010},  
  volume = {To appear},  
  number = {},  
  pages = {}  
}
```

Quick Search

Search for ☒ paper ☐ author

[View all papers](#) | [authors](#)

Repository Status

Last update: 16/06/10
Number of Papers: 415
Number of Authors: 298
[Detailed status ...](#)

Missing Paper?

Email:
Title:
 | [email us](#)

Links

[.. Mutation Testing Online](#)
[.. Mutation Testing Wiki](#)

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Funding



DAASE Programme

DAASE:

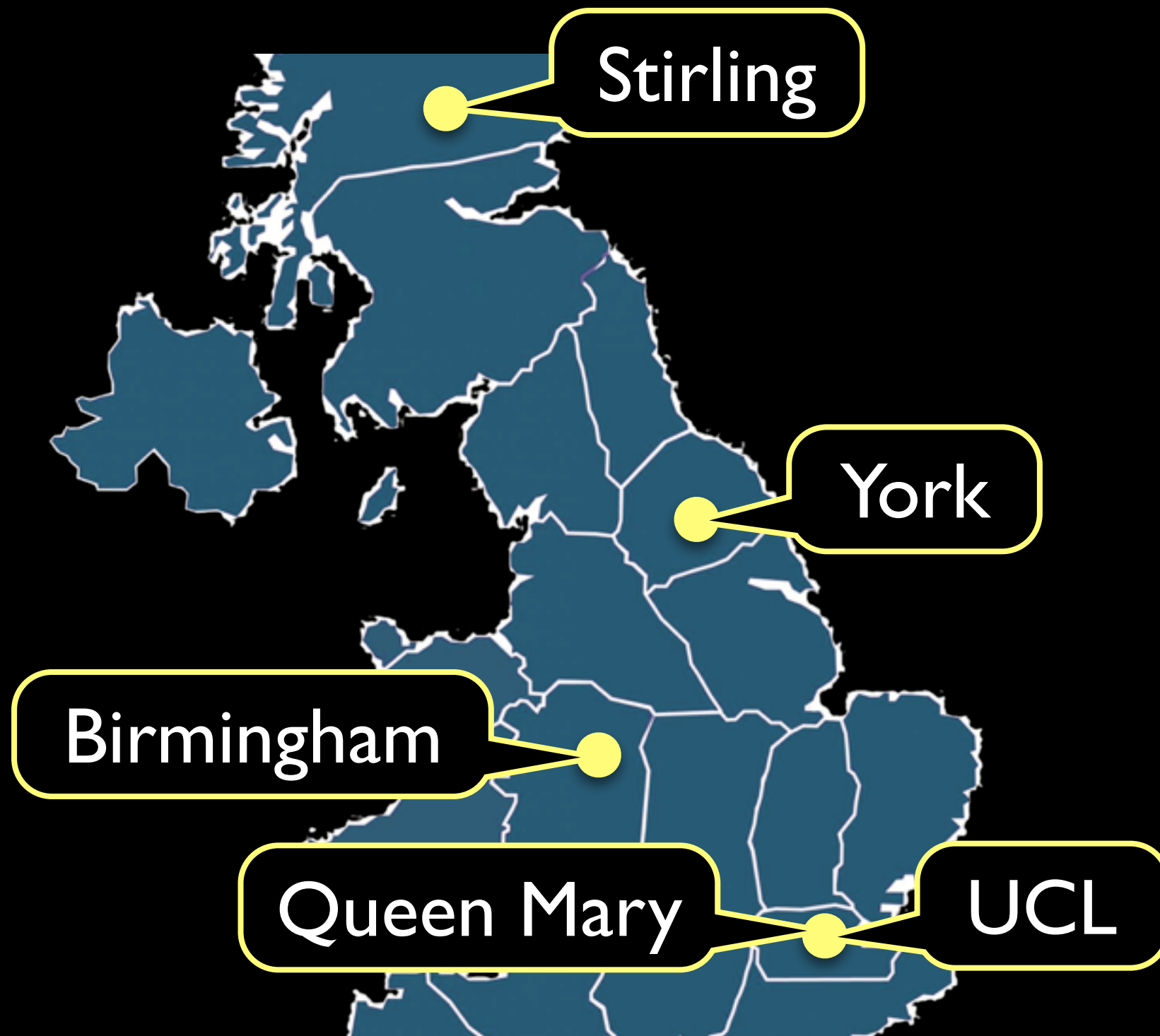
Dynamic Adaptive Automated Software Engineering

£12m project (2012-2018)

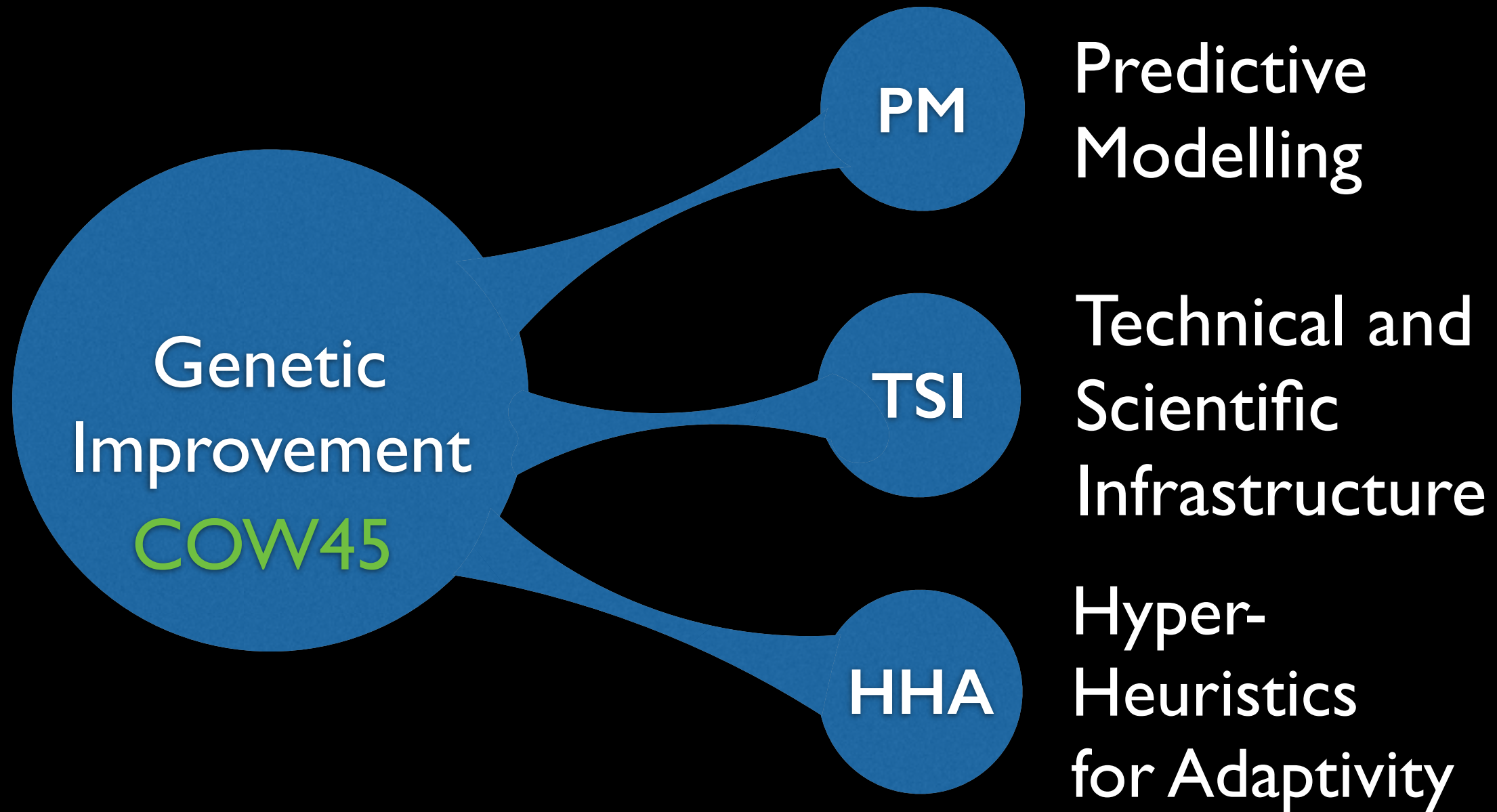
PhD studentships (3 open positions)

RA positions (1 open position)

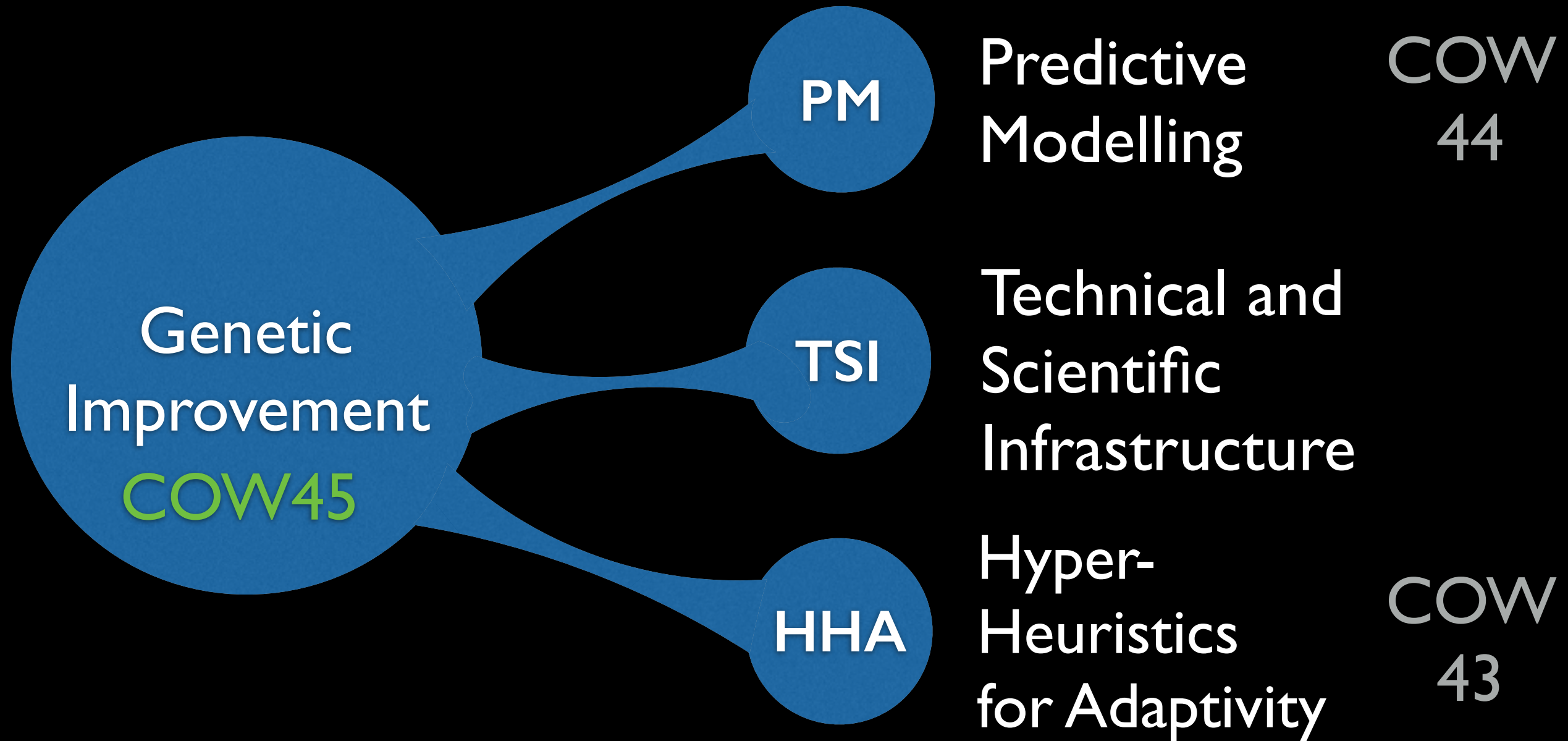
EPSRC
Grant



Themes in DAAASE



Themes in DAAASE



COWs

CREST Open Workshop

Roughly one per month **since 2009**

Discussion based

Recorded and archived

Attendance Worldwide



Country



United Kingdom



United States



Germany



Italy



Sweden



France



Others

Attendance Worldwide



Country United Kingdom United States Germany Italy Sweden France Others

COWs

CREST Open Workshop

Roughly one per month

Discussion based

Recorded and archived

COWs

CREST Open Workshop

Roughly one per month

Discussion based

Recorded and archived

Today's COW

Genetic Improvement

Mark Harman, Justyna Petke, John Woodward

Today's COW



Tweet your
comments and questions
at #cow45

Thanks

Yue Jia & Matheus Paixao, COW Programme manager

Katie Bourke, Administrative arrangements

EPSRC, funding

Attendees and speakers

Domestics

Breaks

Fire or other alarm

Toilets

Wi-fi

Domestics

Breaks

Fire or other alarm

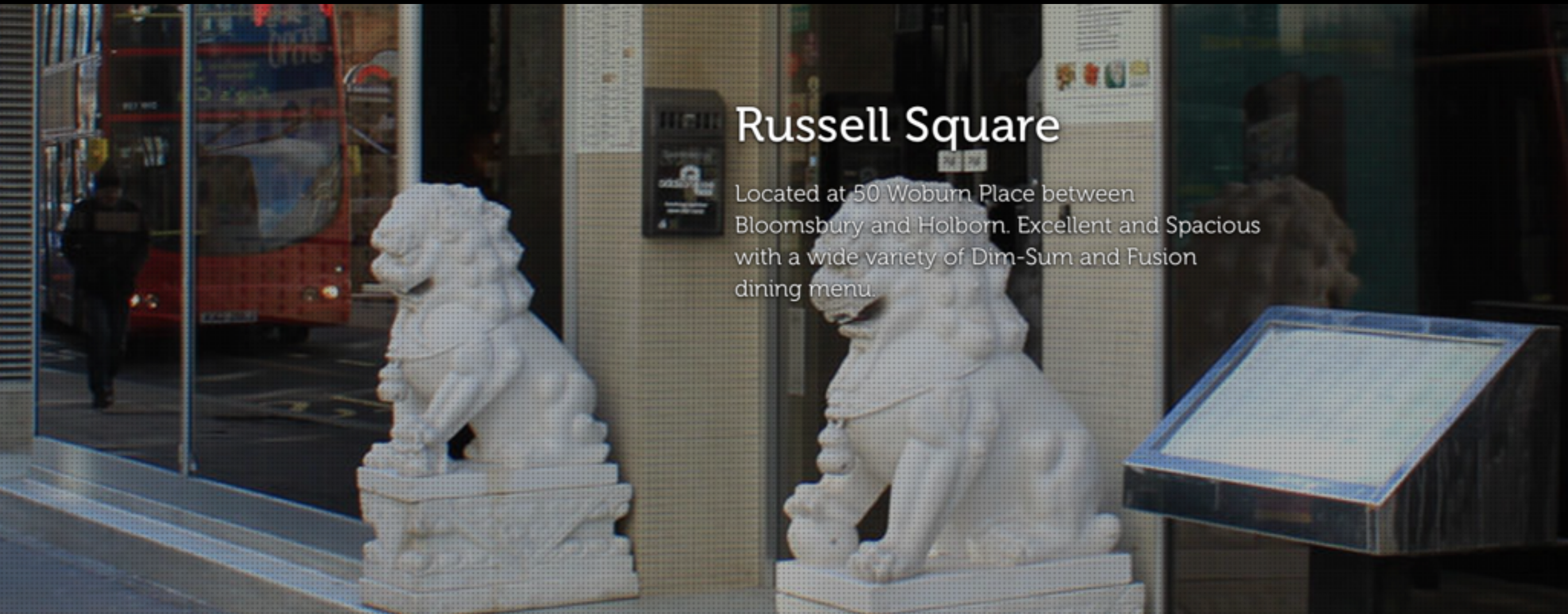
Toilets

Wi-fi

Discussions

Speakers' dinner @ China City Restaurant 6pm

leaving from here at 5.30



Russell Square

Located at 50 Woburn Place between Bloomsbury and Holborn. Excellent and Spacious with a wide variety of Dim-Sum and Fusion dining menu.

Book signing please ...

Introductions ...