

**ACM First International Workshop on  
Data-intensive Software Management and Mining  
(DSMM 2009)**

**Co-located with [CIKM 2009](#)**

**November 6th, 2009  
Hongkong, China**



# Organization

- **Co-organizers**

- Audris Mockus (Avaya Labs, USA)
- Seung-won Hwang (POSTECH, Korea)
- Sunghun Kim (HKUST, China)

- **Keynote speaker**

- Brendan Murphy (MSR, USA)

- **Program Committee**

- Sebastian Michel, Ej Jung, Joachim Selke, Bin He, Chengkai Li, Ahmed Hassan, Shay Artzi, Thomas Zimmermann, Yann-Gael Gueheneuc, Miryung Kim, Lingxiao Jiang, Martin Theobald

# Call For Papers

- Looking for any **SE/PL** research using **DATA**
- 5-page (or less) by July 20, Monday
- ACM Paper(s) with Hong Kong and HKUST visit!



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2 Apr 2009 ... The goal of **DSMM 2009** is to bring DM/DB/SE communities together to initiate the synergetic collaboration and strengthen the ties. ...

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Important Dates. Submissions. Monday, July 20, **2009** by 23:59:59 Apia time. Author notification. Monday, August 10, **2009**. Camera-ready copy ...

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# OCCAT: Object Capturing based Automated Testing

Sunghun Kim <[hunkim@ust.hk](mailto:hunkim@ust.hk)>

HKUST

with Hojun Jaygarl (ISU) and Tao Xie (NCSU)

# Automated Testing

- Useful in practice
- Evaluated by *PIE* [TSE92]
- Current *state of the art* covers 20~40% paths
- Creating *valid objects* is challenging

# Invalid Objects

```
public DSAKeyValue(Document doc, Key key) throws IllegalArgumentException {  
  
    super(doc);  
  
    XMLUtils.addReturnToElement(this._constructionElement);  
  
    if (JavaUtils.implementsInterface(  
        (Object) key, "java.security.interfaces.DSAPublicKey"))  
        this.addBigIntegerElement(((DSAPublicKey) key).getParams().getP(),  
            Constants._TAG_P);  
        this.addBigIntegerElement(((DSAPublicKey) key).getParams().getQ(),  
            Constants._TAG_Q);  
        this.addBigIntegerElement(((DSAPublicKey) key).getParams().getG(),  
            Constants._TAG_G);  
        this.addBigIntegerElement(((DSAPublicKey) key).getY(),  
            Constants._TAG_Y);  
    } else {  
        Object exArgs[] = { Constants._TAG_DSAKEYVALUE,  
            key.getClass().getName() };  
  
        throw new IllegalArgumentException(I18n
```

# Generating Objects

## *Randoop and SMOOT*

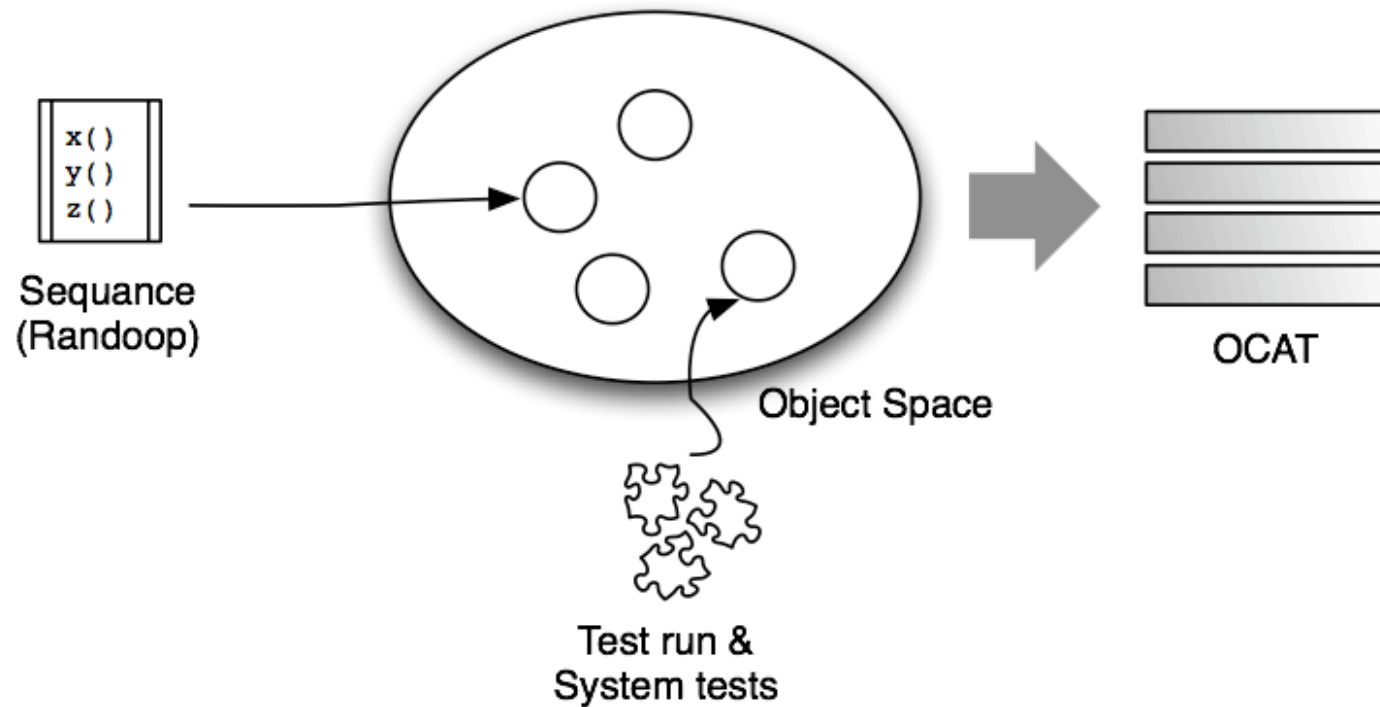
- Automated testing techniques
- Generating valid objects from
  - Randoop: feedback based method sequences [ICSE 07, ISSTA 08]
  - SMOOT: code repertories [ESEC/FSE 09]



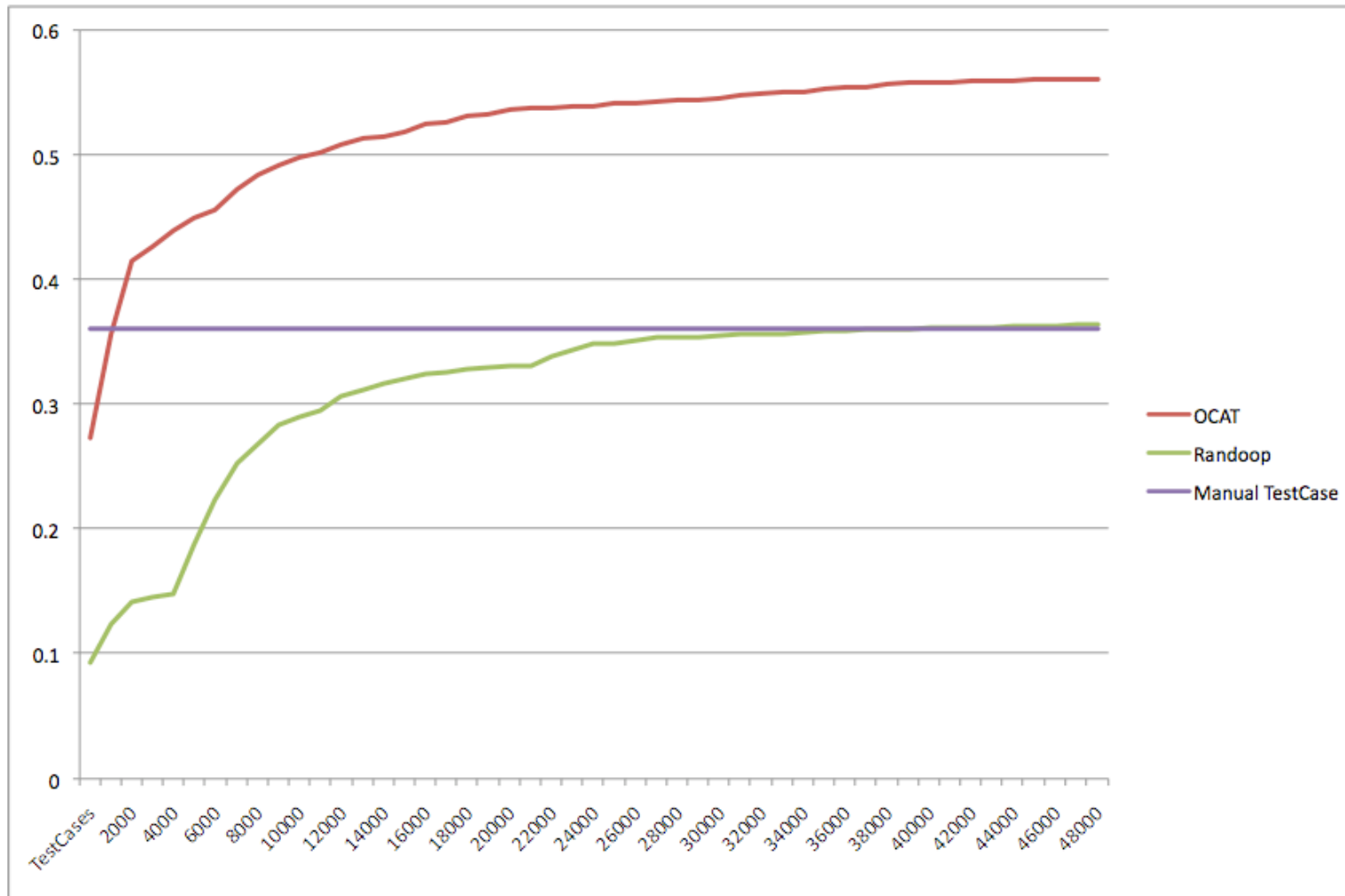
# Limitations

- Statically identifying sequences
- Need to execute code to get objects
- Cannot capture environments
  - I/O, user inputs, etc

# OCAT Approach



# Preliminary Result



# Future Work

- Combine OCAT with SMOOT
- Mutate objects based on path constraints
- Looking for collaborators

