Speculative Analysis:
Exploring Future States of Software

Yuriy Brun*, Reid Holmes†, Michael D. Ernst*, and David Notkin*

*University of Washington and †University of Waterloo
Crystal Demo

http://www.cs.washington.edu/homes/brun/research/crystal
Crystal Demo

http://www.cs.washington.edu/homes/brun/research/crystal
Exploring the Future

Past

Present

Future

Proposed Speculative Development Space

- Mining Software Repositories
- Regression Testing
- Delta Debugging
- Prototyping
- Continuous Testing
- Genetic Programming

Brun, Holmes, Ernst, Notkin (UW)
Exploring the Future

Past

Present

Future

Proposed Speculative Development Space

- Mining Software Repositories
- Regression Testing
- Delta Debugging
- Prototyping
- Continuous Testing
- Genetic Programming

Brun, Holmes, Ernst, Notkin (UW)
Speculative Analysis: Exploring Future States of Software

```java
package com.metamolecular.chemwriter.model;

public class Molecule {
    private List<Atom> atoms;
}
```

<table>
<thead>
<tr>
<th>c</th>
<th>t</th>
<th>m</th>
<th>compile</th>
<th>test</th>
<th>merge</th>
</tr>
</thead>
<tbody>
<tr>
<td>▲</td>
<td>▲</td>
<td>▲</td>
<td>OK</td>
<td>▲412 ▼10</td>
<td>OK</td>
</tr>
<tr>
<td>▲</td>
<td>▲</td>
<td>▲</td>
<td>OK</td>
<td>▲399 ▼23</td>
<td>OK</td>
</tr>
<tr>
<td>▼</td>
<td>Ø</td>
<td>Ø</td>
<td>2 errors</td>
<td></td>
<td>❌</td>
</tr>
<tr>
<td>▼</td>
<td>Ø</td>
<td>Ø</td>
<td>3 errors</td>
<td></td>
<td>❌</td>
</tr>
<tr>
<td>▼</td>
<td>Ø</td>
<td>Ø</td>
<td>2 errors</td>
<td></td>
<td>2 conflicts</td>
</tr>
<tr>
<td>▲</td>
<td>▼</td>
<td>▲</td>
<td>OK</td>
<td>▼422</td>
<td>OK</td>
</tr>
<tr>
<td>▲</td>
<td>▼</td>
<td>▼</td>
<td>OK</td>
<td>▼422</td>
<td>1 conflict</td>
</tr>
<tr>
<td>▲</td>
<td>Ø</td>
<td>▼</td>
<td>OK</td>
<td></td>
<td>1 conflict</td>
</tr>
<tr>
<td>▲</td>
<td>Ø</td>
<td>▲</td>
<td>OK</td>
<td></td>
<td>OK</td>
</tr>
</tbody>
</table>