The Evolution of Exceptions

SCG Seminar – Jakob Schaerer

Exceptions

```
FileReader fr = new FileReader("foo.in");
```

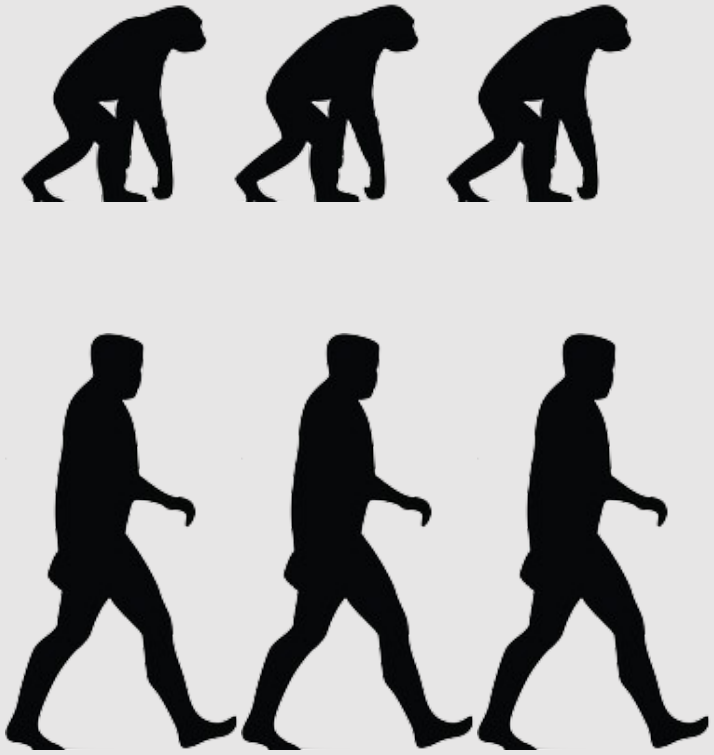
Exceptions

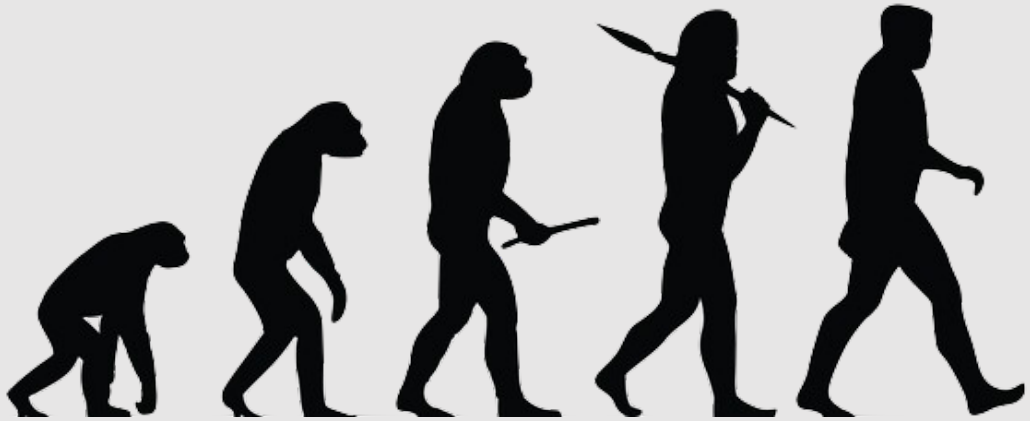
```
FileReader fr = new FileReader("foo.in");
```

Exceptions

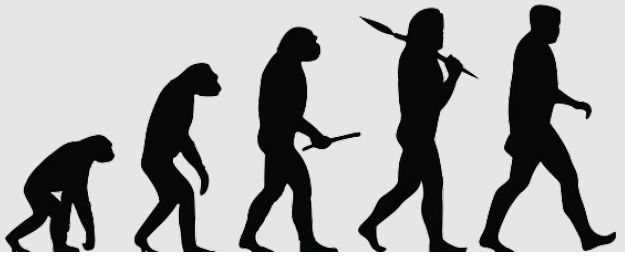
```
FileReader fr;
try {
    fr = new FileReader("foo.in");
} catch (FileNotFoundException e) {
    // TODO Auto-generated catch block
    e.printStackTrace();
}
```

Evolution of Exceptions





Evolution of Exceptions



As a project evolves:

- Do developers introduce more user-defined exceptions?
- Do developers catch more specific exceptions?
- Do developers change the exception handling (catch block)?

Are the answers to these questions the same for different projects?

Objects of Interest

Exception Class

```
public class PresentationException extends Exception {

}
```

Objects of Interest

Try-Catch Block

```
try {

} catch (Exception e) {

}
```

Objects of Interest

Throw Statement

```
throw new Exception();
```

Objects of Interest

Throws declaration

```
public void sample() throws IOException {

}
```

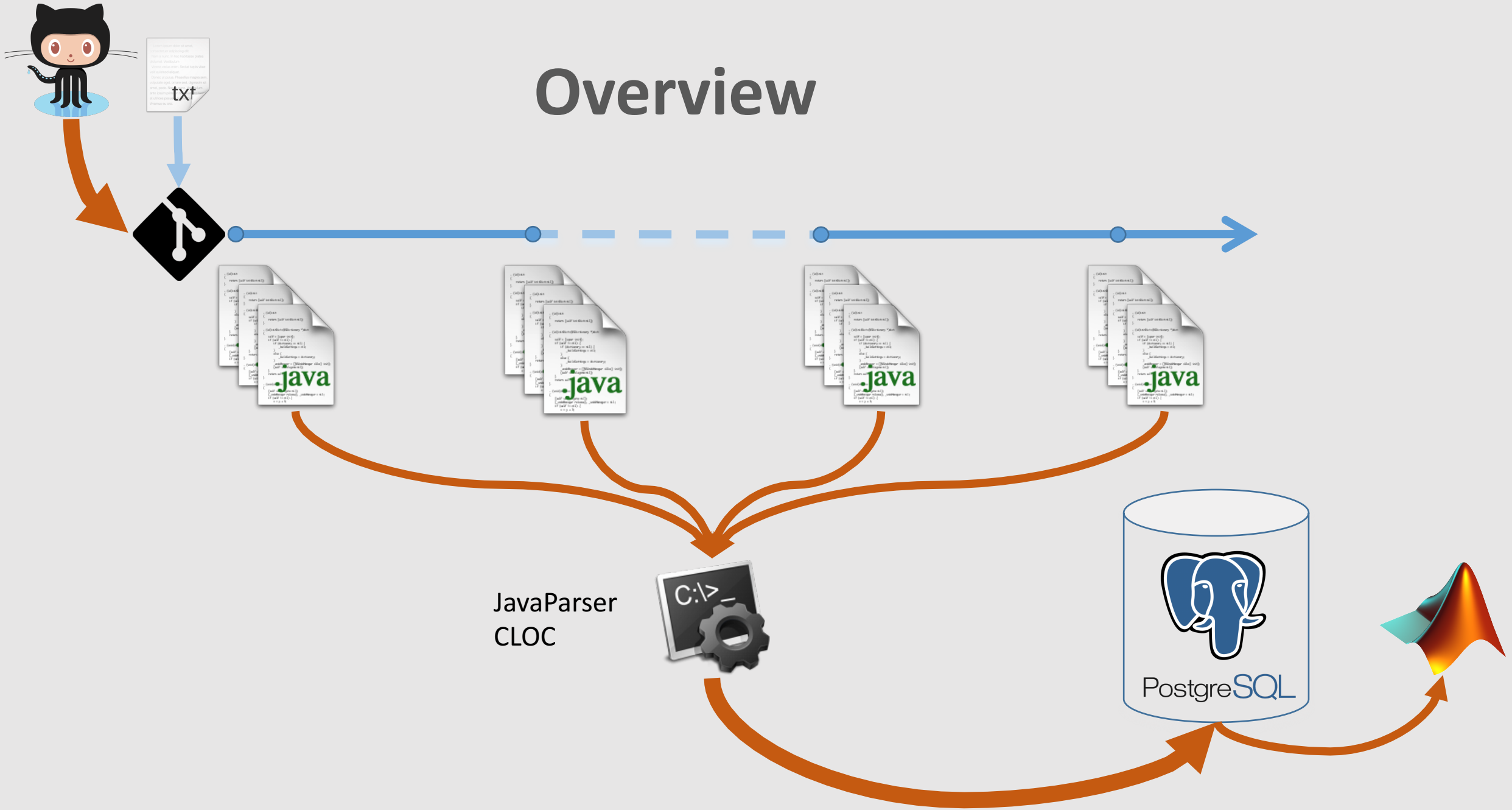
Dataset

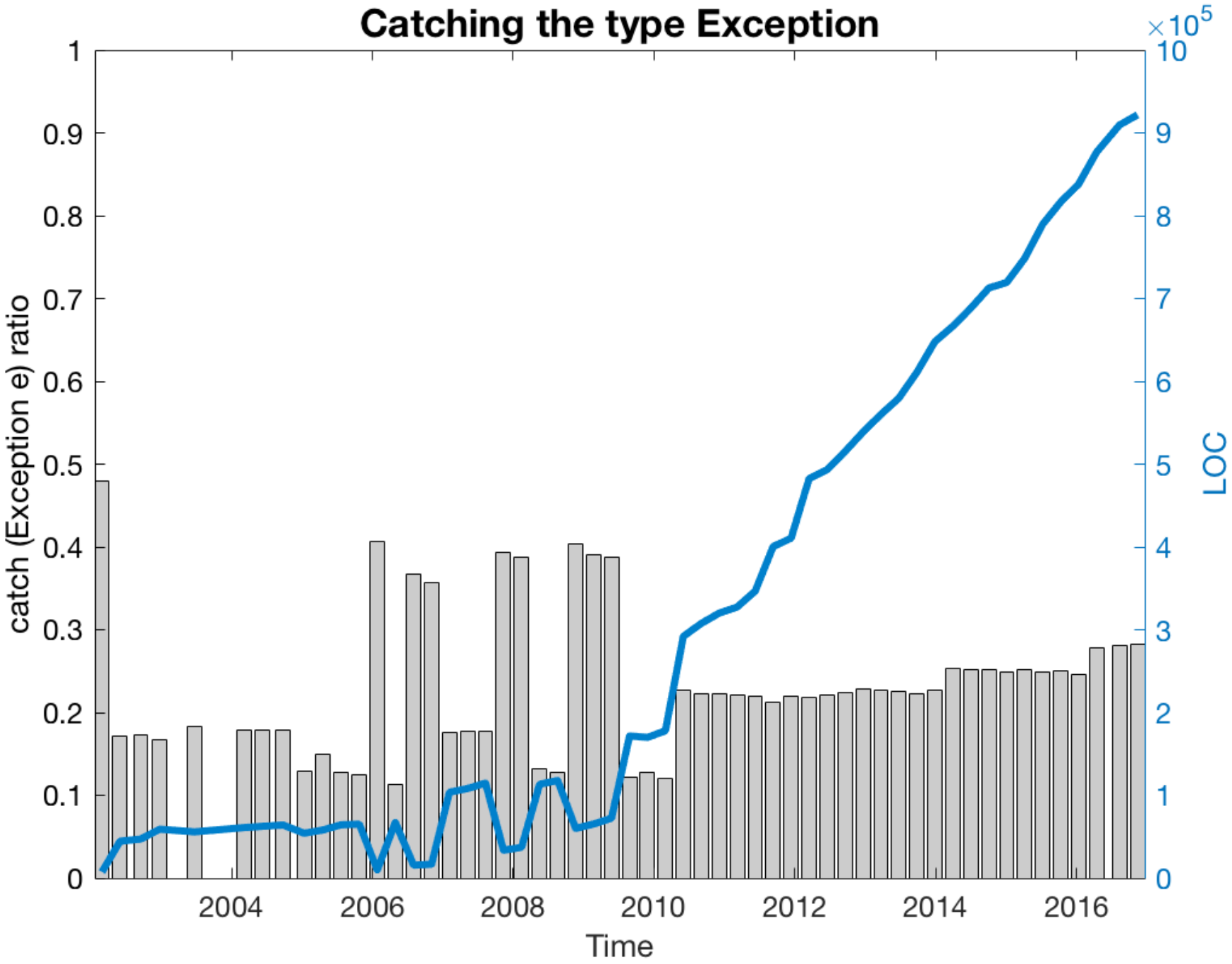
Java Projects from github:

elastic

and counting …

Overview

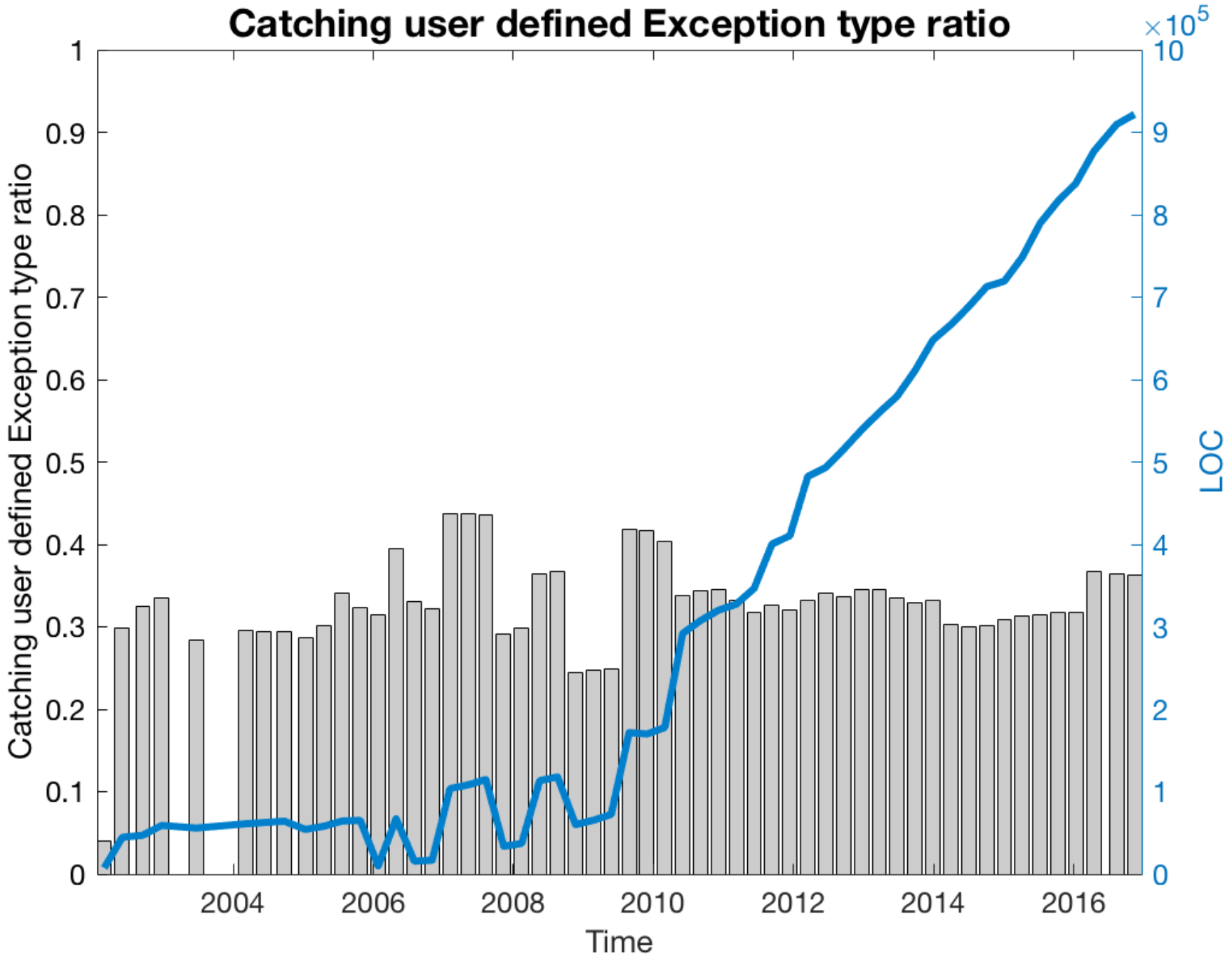



Catching the type Exception
catch (Exception e) ratio
LOC
Time
×10^5
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0
1
2
3
4
5
6
7
8
9
10
2004
2006
2008
2010
2012
2014
2016

Outlook

- Crunch the numbers
- Parse more projects

Questions?


Catching user defined Exception type ratio
Catching user defined Exception type ratio
LOC
Time
×10^5
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0
1
2
3
4
5
6
7
8
9
10
2004
2006
2008
2010
2012
2014
2016

Userdefined Exception Classes
×10^-4
3.5
3
2.5
2
1.5
1
0.5
0
#(Userdefined Exception classes) / LOC
2004
2006
2008
2010
2012
2014
2016
Time

Mu: number of methods that throw user-defined exceptions only
Md: the methods that throw java default exceptions only
Mb: number of the methods that throw both

Ru: The number of “throw" blocks that throw user-defined exceptions
Rd: The number of “throw" blocks that throw java default exceptions

Tu: The number of user-defined exceptions in “throws” blocks
Td: The number of java default exceptions in “throws” blocks

Cu: The number of user-defined exceptions in “catch” blocks
Cd: The number of java default exceptions in “catch” blocks

Uc: The number of user-defined checked exceptions
Uu: The number of user-defined unchecked exceptions

LOC: the number of lines of code