



srcDiff

Exploring and Analyzing Changes to Source Code

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srcDiff [Decker '17]

- Syntactic differencing approach
- Combines edit distance with domain rules
- Better mapping of the programmer's view of change

- JSEP 2019



Name Match

Original	Modified
QTextDocument * m_document;	QTextDocumentPtr m_document;
srcDiff	
QTextDocumentQTextDocumentPtr * m_document;	



Example Change

Original

```
void setImage(Image image) {  
    widget->setImage(image);  
}
```

Modified

```
void setImage(Image image) {  
    if (options) {  
        options->setImage(image);  
    }  
}
```



srcDiff - Unified View

Line Difference

srcDiff

```
void setImage(Image image) {  
- widget-> setImage(image);  
+ if (options) {  
+ options->setImage(image);  
+ }  
}
```

```
void setImage(Image image) {  
if (options) {  
widgetoptions->setImage(image);  
}  
}
```



Enabled Research

- Software Merging
- Clone Detection and Management
- Automatic Generation of Transformations
- Author Attribution
- Feature Location
- Bug Localization
- Commit Message Generation
- Commit Categorization
- Iterative Change Management
- Anything utilizing information on source code changes



srcDiff Infrastructure - Current Development

- GPL
- Source/issue tracking: [GitHub.com/srcDiff](https://github.com/srcDiff)
- www.srcDiff.org

- Extend Language Support for srcDiff differencing engine
 - Refactoring code base for easier rule implementation
 - Java
 - C#

- Building a robust build system and CI/CD pipeline
- Releases: MacOS, Windows, Linux (multiple versions)



srcDiff Infrastructure - Planned Development

- Plugin/configurable Deltas for Additional Languages
- Core srcDiff Differencing and Analysis Library
 - C Language Library
 - Language Bindings (e.g., Python)
- Tools supporting software development built on Core