

Research in Coding and IDEs

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http://hci.rwth-aachen.de/cthci



Time in Software Development

[LaToza2006, Maintaining mental models: a study of developer work habits]







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Models for Developer Strategies

[Ko2006,An Exploratory Study of How Developers Seek, Relate, and Collect Relevant Information during Software Maintenance Tasks]



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Models for Developer Strategies

[Ko2006, An Exploratory Study of How Developers Seek, Relate, and Collect Relevant Information during Software Maintenance Tasks]



31 Professional Java Developers



5 Maintenance tasks (3 Bugs, 2 Enhancements)



500 SLOC Java Paint Application

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Models for Developer Strategies

[Sillito2008, Asking and Answering Questions during a Programming Change Task]



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9 experienced developers (pair programming)

16 developers from industry



l of 5 maintenance tasks per session



Real world change task



ArgoUML 60k SLOC



Real world sour code



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Tools Used in Eclipse

[Murphy2006, How Are Java Software Developers Using the Eclipse IDE?]







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Changing the Presentation

[DeLine2006, Code Thumbnails: Using Spatial Memory to Navigate Source Code]



Changing the Presentation

[Sublime Text 2, http://www.sublimetext.com/2]













Canvas Interfaces in the Wild

[DeLine2012, Debugger Canvas: Industrial experience with the code bubbles paradigm]









Static Analysis in the Wild

[Clang Static Analyzer, http://clang-analyzer.llvm.org/]

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Utilizing Call Graph Information

[LaToza2010, Searching Across Paths]



Call Hierarchy



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Stacksplorer

[Karrer2011, Stacksplorer: Call Graph Navigation Helps Increasing Code Maintenance Efficiency]

Blaze

[Krämer2012, Blaze: Supporting Two-phased Call Graph Navigation in Source Code]









Task Success

Task Completion Time









Comparing Navigation Behavior





[Piorkowski2011, Modeling programmer navigation: A head-tohead empirical evaluation of predictive models]





A Predictor

[Piorkowski2011, Modeling programmer navigation: A head-to-head empirical evaluation of predictive models]

$H=(m_1,, m_i)$	Navigation History	$\mathbf{H} = (\mathbf{a}, \mathbf{b}, \mathbf{a}, \mathbf{d})$
\mathbf{M}_{i}	All methods known to developer at time i	$M_4\!=\!\{a,b,d\}$
$A_i: M_i - \{m_i\} { \rightarrow } \mathbb{R}$	Activation value for each method in $\ensuremath{M_i}$	$A_4(a) = 3$ $A_4(b) = 2$
$R_i: M_i - \{m_i\} \twoheadrightarrow \mathbb{N}$	Rank-transformed version of A_i	$R_4(a) = 1$ $R_4(b) = 2$

Result: N top-ranked methods



Prediction Accuracy







Prediction Accuracy





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// Introducing Codelets...



[Oney2012, Codelets: Linking Interactive Documentation and Example Code in the Editor]

[Victor2012, Inventing on Principle]

Summary



