

Human-Centered Methods for Improving API Usability

Keynote address for
1st International Workshop on API Usage and Evolution (WAPI '17) - <https://w-api.github.io/>

Brad A. Myers

Human-Computer Interaction Institute
School of Computer Science
Carnegie Mellon University
Pittsburgh, PA 15213
bam@cs.cmu.edu
<http://www.cs.cmu.edu/~bam>

Application programming interfaces (APIs) are the way that developers reuse functionality supplied in libraries, software development kits (SDKs), toolkits, frameworks, etc. By adapting a variety of user-centered methods from human-computer interaction (HCI), we have studied usability problems both for API users and for API designers. These studies revealed barriers both at a low level (such as using the factory pattern in an API) and at a high level (such as the lack of example code in the documentation). In lab studies, we have shown that some patterns can slow programmers down by a factor of 10, and in the field, we have seen problematic APIs block programmers for up to a week while they waited for an answer from the API designer. The implications of our results can guide the design of the API, and, when APIs cannot be changed, inspire novel documentation and tools to help use the APIs. Our collaboration with SAP resulted in significant improvements to their APIs, documentation and tools.

This talk will summarize results presented in our recent paper on Improving API Usability [2], along with our newly proposed work on studying the needs of API designers. I will also cover a wide variety of HCI methods we have found to be effective for better understanding and meeting the needs of API users of all levels: novice, professional, and end-user programmers (EUPs). We have applied these methods across all activities of API development: requirements and problem analysis, design, development, testing, and deployment [1]. Since programming is a human process, we have found that many of these HCI methods can be used without change to answer many useful questions, but for other questions, we have needed to create new human-centered methods.

Keywords: *Human-Centered Methods; API Usability; Empirical Software Engineering*

SHORT BIO

Brad A. Myers is a Professor in the Human-Computer Interaction Institute in the School of Computer Science at Carnegie Mellon University. He was chosen to receive the ACM SIGCHI Lifetime Achievement Award in Research in 2017, for outstanding fundamental and influential research contributions to the study of human-computer interaction. He is an IEEE Fellow, ACM Fellow, member of the CHI Academy, and winner of nine Best Paper type awards and three Most Influential Paper Awards. He is the author or editor of 475 publications, and he has been on the editorial board of six journals. He has been a consultant on user interface design and implementation to over 80 companies, and regularly teaches courses on user interface design and software. Myers received a PhD in computer science at the University of Toronto where he developed the Peridot user interface tool. He received the MS and BSc degrees from the Massachusetts Institute of Technology during which time he was a research intern at Xerox PARC. From 1980 until 1983, he worked at PERQ Systems Corporation. His research interests include programming environments, programming language design, end-user software engineering (EUSE), API usability, user interfaces, handheld computers, programming by example, visual programming, and interaction techniques.

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