

# Call for Papers

## IET Software

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### Special Issue:

## Search-Based Software Engineering

Search algorithms have been applied in several areas of software engineering, such as testing, requirements selection, project management, software design and coding. Exact search-based optimization techniques, such as brute force or branch-and-bound, have been applied to some of these areas. But as the problems under interest grow in complexity, the runtime and computer resources demanded by exact techniques limit their application in situations requiring quick answers or the usage of frequently-updated data. On the other hand, such complex problems are common in software development: requirements change frequently, turnover affects the performance of the development team, uncertainties related to the completion of tasks make plans less credible, and developer productivity depends on factors that lay beyond the control of the project manager. The proper selection of development strategies is subject to these uncertainties and must be continually assessed to determine if the decisions taken by stakeholders are still feasible and appropriate given the latest information available. Therefore, many software engineering problems can be seen as optimization problems, but exact optimization techniques may not be efficient enough to solve them in proper time. In comes the field of Search-based Software Engineering (SBSE), on which researchers model software engineering problems as optimization problems and use heuristic search techniques to find good solutions to them. SBSE moves human interaction with software development problems up in the abstraction chain to focus on guiding heuristic search procedures instead of searching for solutions itself. Furthermore, while heuristic search has been successfully applied to the design of artifacts in civil, mechanical and electronic engineering, the search process cannot directly optimize the materials studied in these fields; it can only transverse a design space guided by a model of reality. The search space and guidance are very different when we apply computation search to software. SBSE opens a potent possibility that the search algorithms can directly optimize the engineering material: the programs themselves.

In this Special Issue, we invite papers that address problems in the software engineering domain through the use of heuristic search techniques. We particularly encourage papers demonstrating novel search strategies or the application of computational search techniques to new problems in software engineering. Applications may be drawn from throughout the software engineering life-cycle by investigating the application of SBSE approaches for the automation of all phases of the software development process, including requirement analysis, design, implementation, testing, and maintenance of large software systems.

**Specific topics can include the application of heuristic search to the following areas:**

- Design and code
- Software architecture
- Refactoring
- Software testing
- Software maintenance
- Software quality
- Project management
- Change management
- Recommendation systems
- Development processes
- Component-based Software Engineering
- Service-oriented Software Engineering
- Model-driven Software Engineering
- Software product lines

All submissions are subject to the journal's peer-review procedures. The authors should follow the journal's Author Guide at <http://digital-library.theiet.org/journals/author-guide> when preparing papers for submission to the Special Issue. Expanded conference papers must include at least 30% new material.

**For enquiries regarding this Special Issue please contact the Guest Editors:**

### Important dates:

**Submission deadline:**  
Oct 30 2017

**Publication Date:**  
Aug 2018

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