



## COMPUTER IMPLEMENTED PROGRAM SIMPLIFICATION

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Inventors: Somesh Jha, Mohannad Alhanahnah, Vaibhav Rastogi, Thomas Reps

### The Invention

UW researchers created a computerized system for specializing programs based on a predefined set of desired program functions, thus reducing program bloat while ensuring the soundness of the resulting program. The process relies on the observation that programs can be divided into two components: configuration logic and main logic, the division point is called a program “neck”. The process performs partial interpretation of a program up to the “neck”. The partial interpretation provides a set of variable states at the “neck” that can be reduced to constant values and propagated through the program. The constant-value propagation reveals program instructions that can be eliminated through optimizing transformations. The result is a shorter and substantially simpler program, which can reduce attack surface and optimize its performance

### Applications

Software for debloating programs  
 Programs running on performance constrained devices can leverage this  
 IoT devices would especially benefit

### Key Benefits

Reduces number of functions to “debloat” programs  
 Improves application performance  
 Enhances security  
 Reliable and user friendly

### Additional Information

#### For More Information About the Inventors

- [Somesh Jha](#)
- [Thomas Reps](#)

#### Publications

- [Alhanahnah M, Jain R, Rastogi V, Jha S, Reps T. Lightweight, Multi-Stage, Compiler-Assisted Application Specialization. arXiv. 2021.](#)

#### Tech Fields

- Information Technology, Computing methods, software & machine learning

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