1145-90-2160 **Carla Michini*** (michini@wisc.edu), **Peter Ohmann**, **Ben Liblit** and **Jeff Linderoth**.

Solving the Customized Coverage Probing problem through Set Covering. Preliminary report.

The Customized Coverage Probing problem is a NP-hard problem arising in software development and program debugging. A computer program is represented as a control-flow graph $G = (V, E)$ and each execution corresponds to a path from a designated entry point to an exit point.

Two executions are considered equivalent if they traverse the same nodes in $D \subseteq V$. Moreover, for $I \subseteq V$, we can instrument a node $u \in I$ to check whether u has been traversed during an execution. The Customized Coverage Probing problem asks for a minimum cost instrumentation that can determine whether any two paths are equivalent.

We exploit monotonicity to formulate this problem as a set covering problem. Our formulation has an exponential number of contraints, and we design a polynomial-time separation algorithm to generate violated inequalities.

Computational experiments show that our approach significantly reduces expected run-time probing costs and yields compilation-time overheads that are suitable for wider practical use. (Received September 24, 2018)