Title: Defining the Undefinedness of C

Link: https://www.ideals.illinois.edu/bitstream/handle/2142/30780/ellison-rosu-2012-tr.pdf

What are the problems/research questions addressed by this article?

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This paper investigates undefined behavior in C and offers a few simple techniques for operationally specifying such behavior formally. A semantics-based undefinedness checkerfor C is developed using these techniques, as well as a testsuite of undefined programs. The tool is evaluated againstother popular analysis tools, using the new test suite in addition to a third-party test suite. The semantics-based tool performs at least as well or better than the other tools tested.

What are the existing solutions for this research question/problem?

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The same authors previously worked on this formal semantics to 'c'. They focused primarily on giving semantics to correct programs, and showed how our formal definition could yield a number oftools for exploring program evaluation. The evaluation they performed was against defined programs, and the completeness we claimed was for defined programs.

What is the research method [s] they have used?

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Empirichal research.

What is their proposed solution ?

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In this paper they investigated undefined behaviors in C and how one can capture these behaviors semantically. We discussed three techniques for formally describing undefined behaviors. We also used these techniques in a semantics-based analysis tool, which we tested against other popular analysis tools.

What are three future directions from this article?

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Undefined programs may behave in any way and undefinedness is (in general)

undecidable to detect; this means that undefined programs are a serious problem that needs to be addressed by analysis tools. Whether this is through semantic means or some other mechanism, tools to verify the absence of undefined behavior are needed on the road to fully verified software.

Concepts that you learnt from this paper?

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Undefinedness.
Dereferencing rule.
Indetermined memory.