http://conferences.cis.umac.mo/icde2019/

**Judul:**

OPT+Graph: Visualisasi Program berbasis Web untuk memahami eksekusi graf kode program

**Abstrak:**

Tujuan penelitian ini adalah menghasilkan kakas visualisasi sebagai pendekatan untuk memahami eksekusi graf kode program. Penelitian ini adalah pengembangan kakas dari pythontutor.com (OPT). Kontribusi utama penelitian ini adalah visualisasi eksekusi graf kode program. Metode pengukuran kinerja yang digunakan adalah evaluasi visualisasi. Tekniknya menggunakan survei melalui kuesioner online dengan empat tahap, yaitu tahap pertama mengisi biodata responden, tahap kedua menyelesaikan pretes, tahap ketiga simulasi menggunakan kakas OPT dan kakas hasil pengembangan. Tahap terakhir responden menyelesaikan post-tes. Subyek penelitian ini adalah mahasiswa informatika sarjana (S1) dan pascasarjana (S2) di Institut Teknologi Bandung. Penelitian ini menghasilkan: 1) Pendekatan visualisasi dapat menjadi sarana yang efektif dan efisien untuk memahami eksekusi graf kode program; 2) Usability adalah salah satu aspek penting dalam melakukan visualisasi; 3) ...

Kata kunci: kakas visualisasi, memahami, eksekusi graf kode program

**Title:**

OPT+Graph: Web-Based Program Visualization for Understanding Code Graph Execution in CS Education

**Abstract:**

This paper presents a web-based program visualization tool for C/C++ as an approach to understand the execution of code graph. This tool is based on pythontutor.com (OPT). We examine three fundamental questions in program visualization – how to define understanding, how to build an effective visualization tool, and how to detect graph in the C/C++ code execution. The main contribution of this paper is visualization execution of code graph. Performance measurement method used is evaluation of visualization. The technique used the survey through the online questionnaire with four stages, namely the first stage of populating the demographic of respondents, the second stage of completing the pretest, the third stage of simulation using OPT and OPT+Graph. The last stage of the respondent completed the post-test. The subjects of this study are undergraduate and postgraduate informatics students at Bandung Institute of Technology. The research resulted in: 1) The visualization approach can be an effective and efficient tool for understanding the execution of code graph in C/C++; 2) Usability is one of the important aspects of visualization;

**[Sample]**

This paper presents Online Python Tutor, a web-based program visualization tool for Python, which is becoming a popular language for teaching introductory CS courses. Using this tool, teachers and students can write Python programs directly in the web browser (without installing any plugins), step forwards and backwards through execution to view the run-time state of data structures, and share their program visualizations on the web. In the past three years, over 200,000 people have used Online Python Tutor to visualize their programs. In addition, instructors in a dozen universities such as UC Berkeley, MIT, the University of Washington, and the University of Waterloo have used it in their CS1 courses. Finally, Online Python Tutor visualizations have been embedded within three webbased digital Python textbook projects, which collectively attract around 16,000 viewers per month and are being used in at least 25 universities. Online Python Tutor is free and open source software, available at pythontutor.com.