Giorgos Kritikakis

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Summary

My name is Giorgos (George). I am a passionate software engineer and data analyst. My area of interest includes Software development, Algorithms and Systems Analysis, Data Analysis and Visualization. Currently, I serve in the Research and IT Department at Greek Army (from March 2022 to December 2022).

Skills

Programming languages: Java, C/C++, Python, Javascript, Ocaml.

Applications/Technologies: NetworkX, yWorks, TSP(Tom Sawyer Perspectives), OGDF(Open Graph Drawing Framework), jfree, pthreads, java threads, OMP, MPI, Latex, C Intermediate Language (CIL), Visual Studio, Eclipse, NetBeans, VirtualBox, Git, Matlab, Unix Shell, LLVM.

Operating systems: Windows, Linux.

Web Development: HTML, CSS, CSS Grid, CSS Flexbox, Bootstrap, Javascript, JSP, AJAX.

Professional Experience

IT support
Greek Army - SEAP Heraklion Mar 2022 - present

Maintain all the systems, the servers, and the networks in the military camp.

Volunteer Researcher
University of Crete - Data Visualization Laboratory 2019 - present

My work "Analysis and Visualization of Hierarchical Graphs" offers solutions to vital open problems. The document is on my personal web page and the code in my GitHub repository.

- PBF (Path Based Framework).
  PBF is a new general-purpose hierarchical graph drawing framework. Early results of Path Based Framework were presented as posters in gd2020. The first implementation was integrated into TSP (Tom Sawyer Perspective). In order to make a more advanced tool, with more automation, that creates thousands of drawing in a few milliseconds, I created it as a stand-alone java program. PBF was extensively evaluated, comparing it with the most recent state-of-the-art solution and running a user study. All work is described in the paper "Experiments and a User Study for Hierarchical Drawings of Graphs".
- Path/Chain decomposition graph techniques.
  The chain decomposition heuristic I proposed is the fastest and more practical way to decompose the graph into chain. The paper "Fast and Simple DAG Decomposition with Applications" is currently under peer review in WALCOM 2023.
- Transitive closure, and reachability query solutions.
  Utilizing the chain decomposition algorithms we can offer new bounds in transitive closure solutions. I have suggested a methodology to build an indexing scheme. From 1990 until today, the time complexity bound I offer for this scheme is the lowest. Again, I extensively evaluated the algorithms by running experiments.

Postgraduate Teaching Assistant
University of Crete 2020 - 2022

– CS-484 Complex Network Dynamics [Spring 2021]
– CS-380 Algorithms and Complexity [Fall 2021, Fall 2020]
– CS-486 Principles of Distributed Computing [Spring 2020]

Associate Researcher
Institute of Computer Science (ICS), CARV Laboratory 2019 - 2020

Extension of the SCOOP compiler source-to-source C code transformations. SCOOP produces output for the PARTEE runtime system, a project developed at the Computer Architecture and VLSI Systems (CARV) Laboratory of the Institute of Computer Science (ICS) of the Foundation of Research and Technology Hellas (FORTH). PARTEE runtime uses annotations to specify tasks and their memory footprints. Scoop enables us to use pragma directives for the task annotation.

Education

2022 M.Sc. (Computer Science) at **University of Crete**
Area of Study: *a*) Algorithms and Systems Analysis, *b*) Parallel and Distributed Systems
2020 B.Sc. (Computer Science) at **University of Crete**
Area of Study: Software Systems and Applications.

Publications

- Algorithms and Experiments using the Path Based Hierarchical Drawing Framework. Panagiotis Lionakis, Giorgos Kritikakis, and Ioannis G. Tollis
(poster, 28th International Symposium on Graph Drawing and Network Visualization, GD 2020)
- Experiments and a User Study for HierarchicalDrawings of Graphs. Panagiotis Lionakis, Giorgos Kritikakis, and Ioannis G. Tollis
(ArXiv)

Additional Info

Passionate and curious, I like learning new things. I have attended more than 100 hours of training on online platforms like Udemy in topics like IoT, wireless communication, Arduino Raspberry and esp boards, version control systems (git and GitHub), Linux inter-process communication, web development, and more. Additionally, I have finished lifeguard's school and have long experience as a seasonal lifeguard on the coasts of north Crete.

Several Projects

- Top-down (2, 3, 4) tree with fine-grained synchronization
HY486-Principles of Distributed Computing
- QBert 2D game
HY452-Software Systems and Applications
Allegro library and C++ were used. A project of 2.5K lines of code implemented with a specific architecture.
- 2D card game
HY252-Object-Oriented Programming
Java, Model–view–controller architectural pattern was used
- Liquid Democracy
HY359-Web Programming
Liquid Democracy is a more agile form of democracy. To materialize this system of voting, a web page was constructed based on Java CGI to sign up/login and vote for candidates. Moreover, you can create your own topics and let the

community vote on them online. You can even elect a delegator if you trust someone else. (html, css, javascript, ajax requests, json, servlets, sessions, cokkies , apache server)

- Iperf imitation
  HY435-Network Technology Programming Lab
  Socket programming

- micro tcp protocol
  HY335-Computer Networks
  A reliable protocol over UDP with key features of TCP, socket programming

- Barnes-Hut algorithm, sudoku, game of life
  HY342-Parallel Programming
  pthreads, java threads, OMP

- Linux C shell (command interpreter)
  HY345-Operating Systems
  Processes manipulation, System Calls, interprocess communication (pipes), shell variables, redirection (dump2).

- Alpha programming language(compiler)
  HY340-Languages and Compilers
  Lexical analysis (lex), syntax analysis (yacc), intermediate code generation (quads), target code and virtual machine.

- Remote control and monitoring system for devices and sensors
  Raspberry Pi, arduino, full-stack development, DYI project