

Program Analysis And Its Support For Software Development

Class homepage: www.cs.utsa.edu/~qingyi/cs6463

Class hours: TTR, 5:30-6:45pm

Room: HSS 2.01.44

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Office: SB 4.01.30 **Phone:** x5671

Office Hours: by appointment

Textbook	<u>Principles of Program Analysis</u> by Flemming Nielson, Hanne R. Nielson, Chris Hankin. ISBN 3-540-65410-0
Overview	<p>The class will study the principles of program analysis and the algorithmic techniques in automatically discovering important properties of source programs without running the program. Topics include the theoretic foundation of four main program analysis approaches, control flow analysis, data flow analysis, abstract interpretation, and type and effect systems, as well as how to apply these approaches to discover properties of scalar variables, pointer variables, and shapes of complex data structures.</p> <p>The class will be separated into three components: (1) Instructor lectures that cover fundamental program analysis techniques and algorithms. (2) Student presentations of research papers in the area of applying program analysis to improve programming productivity. (3) Student projects that use existing open-source tools to build program checkers.</p>
Class Objective	Students will study cutting edge program analysis techniques and be involved a number of group projects that aim to automatically analyze C/C++ code to identify important properties of input programs. Students will learn how to adapt existing tools as well as how to implement various algorithms from scratch.
Prerequisites	Familiarity with C/C++
Requirements	By the end of the class, you should have sufficient understanding of the fundamental theories and basic implementation skills of advanced program analysis techniques used in both compilers and a wide range software development tools. You will be required to read and present a research paper, and work on a research project to gain deeper understanding of the theories and techniques.
Grading	40%: projects; 30%: research presentations; 30%: in class exercises.
Attendance	You are responsible for all presented material and assigned readings in class.
Collaboration Policy	You are expected to work on most of the projects in a group. A leader will be elected for each group, and the work done by each individual must be explicitly reported in the project submission.

Email Policy

Questions about lectures and projects may be emailed to the instructor and will receive prompt responses.