CS6843: Program Analysis

Jan-May 2018
'C' Slot; CS 26
Slots are: Mon 10:00, Tue 09:00, Wed 08:00, Fri 12:00
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TA(s): *TBA*

Updated on January 11, 2018

Course related communication will be on Moodle. Information is on the `http://www.cse.iitm.ac.in/~rupesh/teaching/pa/jan18/`.

1 Course objectives

Students would learn to analyze C-like programs to extract information for varied application domains such as security and parallelization.

2 Learning Outcomes

- to convert a source program into its intermediate representation (IR)
- to perform standard data flow analyses on the IR
- to develop new analyses on the IR
- to understand trade-offs in precision and efficiency

3 Course prerequisite(s)

CS3300 or equivalent

4 Classroom Mode

Traditional lectures, intermixed with tutorial problem-solving in class

5 Textbooks

- Advanced Compiler Design and Implementation, Muchnick, Morgan Kaufmann 1997.

6 Reference Books

Material from the following books and research papers will be used as necessary.

- Compilers: Principles, Techniques and Tools (2nd Edition), Aho, Lam, Sethi, Ullman, Addison Wesley 2006.
- Data Flow Analysis: Theory and Practice, Khedker, Sanyal, Karkare, CRC Press 2009.
- Principles of Program Analysis: Nielson, Nielson, Hankin, Springer 2004.

7 Attendance Requirements

Standard institute rules apply.

8 Planned Syllabus

The following topics will be covered, but not necessarily in the order listed below:

1. Basic Dataflow Analysis
2. Pointer Analysis
3. Shape Analysis
4. Dynamic Analysis
5. Parallelization
6. Program Slicing
7. Security Analysis

9 Grading Policy

MidSem	25%	March 9
EndSem	25%	May 3
4 Prog. Assign.	50%	January 21, February 11, March 18, April 15

10 Academic Honesty

Standard DISCO rules apply. It is your responsibility to protect your code.