Curriculum Vitae

Vineeth Paleri
Professor
Department of Computer Science and Engineering
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Education

- Doctor of Philosophy (August 1994 - July 1999), Department of Computer Science and Automation, Indian Institute of Science, Bangalore. Thesis title: An Environment for Automatic Generation of Code Optimisers.

- Master of Technology (August 1984 - January 1986), Department of Computer Science and Engineering, Indian Institute of Technology, Kanpur. Cumulative Performance Index: 8(Out of 10).

- Bachelor of Engineering (Electrical) (1976 - 1981), Department of Electrical Engineering, National Institute of Technology, Calicut (Formerly Regional Engineering College, Calicut). First Class(Honours).

Professional Appointments

- Professor (August 2005 - Present), Department of Computer Science and Engineering, National Institute of Technology, Calicut. Joined as a faculty member in May 1986.

- Visiting Scientist (May - June 2005), Department of Computer Science and Automation, Indian Institute of Science, Bangalore.

- Visiting Assistant Professor (January 2003 - December 2003), Department of Computer Sciences, Purdue University, West Lafayette, USA.

- Visiting Assistant Professor (January 2002 - December 2002), Department of Computer and Information Science, Indiana University Purdue University, Indianapolis, USA.

- Software Engineer Trainee (August 1982 - July 1984), Computer Center, Indian Institute of Technology, Kanpur.

Research

Research Interests

- Programming, Program analysis, and Code optimisation.

Publications

- Reshma Roy, Vineeth Paleri. Lexical-based partial redundancy elimination: An optimal algorithm with improved efficiency, Journal of Computer Languages, Volume 75, 2023.

- Sreekala S, Vineeth Paleri. Copy Propagation subsumes Constant Propagation. arXiv: 2207.03894v1 [cs.PL], 2022.

- Jasine Babu, Karunakaran Murali Krishnan, and Vineeth Paleri. A fix-point characterisation of Herbrand equivalence of expressions in data flow frameworks. In: Khan M., Manuel A. (eds), Logic and Its

Applications, ICLA 2019 (IIT Delhi), Lecture Notes in Computer Science, Vol. 11600, pp. 160-172, Springer, Berlin.

- Saleena Nabeezath, Vineeth Paleri. A Simple Algorithm for Global Value Numbering, arXiv: 1303.1880v1 [cs.PL], 2013.

- Vineeth Paleri, Y.N.Srikant, and Priti Shankar. Partial Redundancy Elimination: A Simple, Pragmatic, and Provably Correct Algorithm. Science of Computer Programming 48, 1(2003), 1-20.

- Vineeth Paleri. Automatic Generation of Code Optimisers from Formal Specifications. In Y.N.Srikant and Priti Shankar, Editors. The Compiler Design Handbook: Optimisations and Machine Code Generation. CRC Press, 2002.

- Vineeth Paleri, Y.N.Srikant, and Priti Shankar. A Simple Algorithm for Partial Redundancy Elimination. ACM SIGPLAN Notices 33, 12(1998), 35-43.

PhD Students

- Nabizath Saleena. Thesis Title - Detection of Redundant Expressions: Efficient Algorithms with Improved Precision, April 2016.

- Rekha Pai. Thesis Title - Detection of Redundant Expressions: Complete and Efficient algorithms in SSA, September 2017.

Teaching

Graduate Level

- **Compiler Design**: National Institute of Technology Calicut, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2018, and 2019.
  The course covers advanced topics in Code Optimisations and Machine Code Generation. The topics included Intermediate Representation, Control Flow Analysis, Data Flow Analysis, Code Optimisation, Static Single Assignment Form, Register Allocation, and Machine Code Generation.

- **Programming Languages**: Indiana University Purdue University Indianapolis, 2002; National Institute of Technology Calicut, 2004, 2005, 2006, 2007, 2016, and 2017.
  The course when offered last time covered formal semantics and type systems. The contents included untyped and typed lambda calculus, extensions of lambda calculus with additional features, and type safety.

Undergraduate Level

- **Foundations of Programming**: National Institute of Technology Calicut, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2019, 2020, 2021, and 2022.
  The course addresses the issue of software reliability with an emphasis on specification and design before proceeding to implementation. The methodology uses the principle of separation of concerns as its basis, which makes the way for effective use of the concepts of procedural abstraction, data abstraction, and modular design to build reliable programs. The methodology is consolidated through an associated laboratory by writing programs in Scheme language.

- **Principles of Programming Languages**: Indiana University Purdue University Indianapolis, 2002 and National Institute of Technology Calicut, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, and 2020.
  The course covered the underlying concepts and constructs of programming languages in a formal setting - with formal semantics and type systems. The contents included untyped and typed lambda calculus and its extensions - Let bindings, Records, Variants, and References. Operational semantics was used as the vehicle for specifying semantics.

- **Principles of Compilers:** National Institute of Technology Calicut, 2004, 2005, 2006, 2007, 2013, 2014, 2015, 2016, 2020, 2021, and 2023.
  The course covered lexical analysis, syntax analysis, semantic analysis, and intermediate code generation in detail, and gave an introduction to code optimisation and machine code generation. The course included a semester project to develop a compiler for a simple high-level procedural language designed for the purpose. The project expected the students to translate the source program to an intermediate language and then interpret the code in the intermediate language.

- **Software Engineering**: Purdue University, 2003; Indiana University Purdue University Indianapolis, 2002.
  The course at Purdue University covered all aspects of software development including requirements, specification, design, implementation, integration, documentation, and maintenance. The course included a team project to develop a Generic Document System with plug-in facility to add features, as needed. The project stressed the software development process with deliverables at the end of each phase in the development process. The deliverables included: prototype, requirements document, specification, project management plan, architectural design, detailed design, code, test cases, peer review reports, and user manuals. (The coverage of the course at Indiana University Purdue University Indianapolis was similar to the coverage given at Purdue University except for the fact that the project was to develop an Interactive Messaging System.)

Program Development

- An environment for automatic generation of code optimisers(1999) - Part of PhD work at Indian Institute of Science, Bangalore: A tool for generating C code for optimisers from their formal specifications. Built on top of Stanford University Intermediate Format(SUIF), in C language, under UNIX environment.

- A database for Alumni Association, National Institute of Technology, Calicut(1988): Code in DBASE III, under DOS environment. Extensively used by Alumni Association, National Institute of Technology, Calicut.

- An integrated environment for Pascal(1986) - Project work of Master of Technology at Indian Institute of Technology, Kanpur: A tool for providing an integrated environment for Pascal programmers on DEC-1090 system, written in Pascal and Assembly language under TOPS-10 environment. Used in the programming laboratory for undergraduate students at Indian Institute of Technology, Kanpur.

Other Academic Activities

- Seminar: Software Engineering: A Methodology for Reliable Software. Software Engineering Research in India talk series(Online), November 15, 2022.

- Member, Program Committee, Technical Track on Programming Languages, ACM Symposium on Applied Computing, 2018, 2019, 2020, and 2021.

- Lectures: 1. The Discipline of Computing. 2. Programming Methodology. Refresher Course in Computer Applications for College/University teachers, UGC Human Resource Centre, University of Calicut, November 11, 2018.

- Article: The Roles of Academia and Industry. Siliconindia Magazine, July 2018, pp. 20-21. https://www.siliconindiamagazine.com/magazine/university-ranking-special-july-2018/

- Course: With Saleena N. Foundation Course on Compiler Design, Vikram Sarabhai Space Centre(VSSC), Thiruvananthapuram, July 12-13, 2016.

- Lecture: Programming Methodology. Arbitron India, Info Park Kochi, March 30, 2012.

Service

- Secretary, Technology Business Incubator, National Institute of Technology Calicut, September 2009 - November 2018.
- Member, Board of Governors, National Institute of Technology Calicut, March 2013 - March 2015.
- Head, Department of Computer Science and Engineering, National Institute of Technology Calicut, July 2008 - July 2010.
- Member, Core Committee for preparation of specification for software development of centralised counselling of AIEEE 2004.
- Faculty-in-Charge, Main Computer Center, National Institute of technology, Calicut, Jan 1993 - June 1994 and Aug 1999 - Dec 2001.
- Member, Curriculum Committee for Under Graduate Programme in Computer Engineering/Information Technology, University of Calicut, 2000.