

# Mihir P Mehta

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<b>Education</b>	<b>Ph.D., Computer Science</b> (2014 - present) University of Texas at Austin GPA: 3.3/4
	<b>B.Tech., Computer Science and Engineering</b> (2009 - 2013) Indian Institute of Technology (IIT) Delhi GPA: 7.9/10
	<b>Exchange semester</b> , Ecole des Mines, Saint-Etienne (2011)
<b>Professional Experience</b>	<b>Research Intern</b> at Oracle Corp., Belmont, CA, USA. (2018) <ul style="list-style-type: none"><li>Completed a code proof to certify the correctness of a highly optimised assembly language program.</li><li>Contributed to a timing analysis of this program, to ensure the avoidance of race conditions.</li><li>Studied the potential use of the TLAPS theorem prover for distributed systems, and created some preliminary internal documentation.</li></ul>
	<b>Research Intern</b> at Apple Computer, Inc., Austin, TX, USA. (2017) <ul style="list-style-type: none"><li>Used model checking tools towards verifying Apple's hardware microarchitectures</li><li>Developed proofs of correctness of hardware components with respect to specifications, with code changes where necessary.</li></ul>
	<b>Research Intern</b> at Intel Corporation, Austin, TX, USA. (2015) <ul style="list-style-type: none"><li>Built a Pintool to dynamically analyse executables.</li><li>Augmented the analysis with fine-grained information obtained from static analysis techniques.</li></ul>
	<b>Software Engineer</b> at Samsung Research Institute, Noida, India. (2013-2014) <ul style="list-style-type: none"><li>Optimised the Linux kernel for Samsung's Android devices.</li><li>Improved core components of the Linux virtual memory subsystem.</li></ul>
<b>Research Experience</b>	<b>Filesystem modelling for FAT32</b> with Professor William R. Cook, CS department, UT Austin. (2016-present) <ul style="list-style-type: none"><li>Developed a binary-compatible executable model for the FAT32 file system.</li><li>Used the model as a basis for separation-based reasoning about filesystems and filesystem clients with the ACL2 theorem prover.</li></ul>
	<b>Program verification in object-oriented languages</b> with Professors Isil Dillig and Thomas Dillig, CS department, UT Austin. (2014-2015) <ul style="list-style-type: none"><li>Developed a prototype verifier based on Hoare logic and weakest pre-conditions.</li><li>Used the Soot compiler framework to generate verification conditions and the Z3 theorem prover to discharge them.</li><li>Generated example inputs demonstrating bugs in several test programs.</li></ul>
	<b>Algorithms for bisimilarity</b> with Professor S Arun Kumar, CSE Department, IIT Delhi (2012-2013) <ul style="list-style-type: none"><li>Conceptualised and implemented a toolkit for verifying bisimilarity and other properties of timed automata and labelled transition systems.</li><li>Improved an algorithm for generating a zone graph from a timed automaton.</li></ul>

Publications	<p>Mihir Parang Mehta. <b>Formalising Filesystems in the ACL2 Theorem Prover: an Application to FAT32</b>. In: <i>Proceedings of the 15th International Workshop on the ACL2 Theorem Prover and Its Applications, Austin, Texas, USA, November 5-6, 2018. Electronic Proceedings in Theoretical Computer Science</i>. Matt Kaufmann and Shilpi Goel, editors. Vol. 280, pp. 18-29, 2018. Full text: <a href="https://cgi.cse.unsw.edu.au/~eptcs/paper.cgi?ACL22018.2">https://cgi.cse.unsw.edu.au/~eptcs/paper.cgi?ACL22018.2</a>.</p> <p>Mihir Parang Mehta, William R. Cook. <b>Binary-Compatible Verification of Filesystems with ACL2</b>. In: <i>10th International Conference on Interactive Theorem Proving (ITP 2019) (Leibniz International Proceedings in Informatics (LIPIcs))</i>, John Harrison, John O’Leary, and Andrew Tolmach (Eds.), Vol. 141. Schloss Dagstuhl-Leibniz-Zentrum fuer Informatik, Dagstuhl, Germany, 25:1-25:18. Full text: <a href="https://doi.org/10.4230/LIPIcs.ITP.2019.25">https://doi.org/10.4230/LIPIcs.ITP.2019.25</a>.</p> <p>Mihir Parang Mehta, William R. Cook. <b>Separation Logic-Based Verification atop a Binary-Compatible Filesystem Model</b>. To appear in: <i>23rd Brazilian Symposium on Formal Methods (SBMF 2020)</i>. Preprint: <a href="https://hal.archives-ouvertes.fr/hal-02956858">https://hal.archives-ouvertes.fr/hal-02956858</a>.</p>
Coursework (selected graduate courses)	<p><u>UT Austin</u>: Automated Logical Reasoning, Introduction to Mathematical Logic, Formal Verification and Semantics, Automatic Verification of Software, Numerical Linear Algebra, Dependable Computing Systems, Advanced Operating Systems, Recursion and Induction.</p> <p><u>IIT Delhi</u>: Compiler Design, Theory of Computation, Numerical Optimisation.</p>
Teaching assistantships (UT Austin)	<p><u>Graduate courses</u>:</p> <p>CS386L Programming Languages (Fall 2016, Spring 2020)</p> <p>Convex Optimization (Fall 2019)</p> <p><u>Undergraduate Courses</u>:</p> <p>CS439N Operating Systems (Fall 2015, Spring 2016, Fall 2020)</p> <p>CS340D Debugging and Verifying Programs (Spring 2018)</p> <p>CS392F Automated Software Design (Spring 2019) CS371G Generic Programming (Summer 2020)</p>
Technical Skills	<p>Theorem provers: ACL2, Agda, Coq, TLAPS.</p> <p>Programming languages: Functional languages (OCaml, SML), logic programming languages (Prolog), hardware description languages (VHDL, Verilog).</p> <p>Operating systems: GNU/Linux (kernel and application development).</p> <p>Compiler frameworks: Soot (Java), LLVM (C++).</p> <p><u>Others</u>: Xilinx, Matlab, PostgreSQL.</p>
Scholastic Achievements	<ul style="list-style-type: none"> <li>• Awarded the UT Austin Graduate School’s Recruitment Fellowship. (2014-2017)</li> <li>• All India Rank 138 (out of 400000), Joint Entrance Examination (IIT-JEE). (2009)</li> <li>• Secured All India Rank 29 in the All India Engineering Entrance Examination (AIEEE) among 1000000 candidates. (2009)</li> <li>• Scored 99 percentile in Verbal and Analytical Reasoning, GRE. (2012)</li> </ul>
Others	<p><u>Languages</u>: English, French, Gujarati, Hindi.</p>