

David R. Bild

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RESEARCH INTERESTS	Censorship- and surveillance-resistant communication, ad hoc networks, social network analysis, integrated circuit reliability (e.g., NBTI), integrated circuit testing.	
PHD	University of Michigan – Ann Arbor , COMPUTER SCIENCE AND ENGINEERING <ul style="list-style-type: none">• Non-Hierarchical Networks for Censorship-Resistant Personal Communication• Advisor: Professor Robert P. Dick	Jan. 2009 – Apr. 2014
MS	Northwestern University , COMPUTER ENGINEERING <ul style="list-style-type: none">• Static NBTI Reduction Using Internal Node Control• Advisor: Professor Robert P. Dick	Sept. 2007 – Dec. 2008
BS	Northwestern University , COMPUTER ENGINEERING <ul style="list-style-type: none">• cum laude• GPA: 3.75	Sept. 2003 – June 2007
COMPUTER SKILLS	Programming Languages Development Platforms DevOps Data Analysis Version Control Optimization Hardware Design	Scala (inc. Scalaz & Play), Java, Python, Javascript, C Android, Linux. Docker, AWS, Ansible. SQL (PostgreSQL, MySQL), Hadoop. git, svn, cvs. MILP via AMPL, CPLEX, SYMPHONY. VHDL, Verilog, Synopsys (Design Compiler, PrimeTime, TetraMax).
PROFESSIONAL EXPERIENCE	Xaptum, Inc. , Chicago, IL <i>Vice President, Product Delivery</i> <i>Principal Product Architect</i> <i>Principal Product Engineer</i> Secure, real-time communication for the internet of things. Tellur, Inc. , Chicago, IL <i>Co-founder</i> A virtual assistant for personal finance. Users create tasks instructing Tellur what bank account activity to watch for and how to respond. <ul style="list-style-type: none">• Designed and implemented all backend APIs, task execution, notification delivery, and Intuit data integration.• Designed the type system and language underlying the Tellur custom task builder. Assisted frontend engineer with implementation.• Developed a free monad-based Scala library for typesafe, composable, referentially transparent, and testable usage of the Intuit Transactions API.• Configured and maintained all AWS infrastructure (VPC, EC2, RDS, EBS) and services (S3, Cloudfront, Route53) using a combination of Cloudformation and Ansible.• Developed a Python library for concise, composable, and programmatic declaration of Cloudformation templates.• Coordinated pre-launch security assessment with third-party security firm. Cardcast, LLC , Chicago, IL <i>Co-founder</i>	Apr. 2017 – present Sept. 2016 – Mar. 2017 Jun. 2016 – Aug. 2016 Jan. 2015 – Apr. 2016 Mar. 2014 – present

University of Michigan, EECS Dept., Ann Arbor, MI

Graduate Student Research Assistant

Jan. 2009 – Feb. 2014

- Designed a protocol to detect Sybil attacks in ad hoc wireless networks [J1, P9]. Implemented for the Linux kernel [S5].
- Developed statistical models of user behavior in Twitter and characterized the structure of the retweet graph [J2].
- Designed a censorship-resistant ad hoc microblogging protocol [C4, C6, P12]. Implemented for Android [S7, S8].
- Designed an event-tracing tool to optimize smartphone application and platform performance [C5]. Implemented for Android [S6].
- Designed an Fmax testing method to reduce test time from linear to constant in the number of DVFS voltages [P13].

Northwestern University, EECS Dept., Evanston, IL

Research Assistant

Sept. 2007 – Dec. 2008

- Developed an internal node control-based technique to reduce NBTI degradation in idle functional units [J3, C7].
- Developed a temperature-aware testing scheduling algorithm [C8].

Sandia National Laboratories, Albuquerque, NM

Intern

June – Sept. 2007

Supported the design and test of an FPGA-based high-throughput data processing module for a space application:

- Developed scripts to control a module tester and automate common tests and developed a GUI to ease human control of the tester.
- Redesigned and implemented control logic for the tester's control FPGA to improve test automation capabilities.
- Designed a clock detection circuit for an FPGA.

Intern

June – Sept. 2006

Supported design and test of an FPGA-based high-throughput data processing module for a space application:

- Designed an automated assertion-based testbench for simulation-based functional verification of a system-board containing multiple FPGAs.
- Manually validated PCB Gerber artwork against the schematic netlists.

Intern

June – Sept. 2005

- Developed core assets (e.g., reusable software components) to support the implementation of a product-line approach to software development.
- Wrote data-verification and comparison software to support a database merger.

Northwestern University Information Technology, Evanston, IL

Student Manager

Mar. 2005 – June 2007

- Managed a team of ~13 students who provided phone-based and on-site troubleshooting for the audio-visual equipment in Northwestern's "smart" lecture halls.
- Responsibilities included training, performance evaluation, discipline, shift scheduling, and website maintenance.

Tech Support Consultant

Sept. 2004 – Feb. 2005

- Provided phone-based and on-site support to faculty using the audio-visual equipment in Northwestern's "smart" lecture halls.
- Supported users in Northwestern's public computer labs.

TEACHING
EXPERIENCE

University of Michigan – Ann Arbor, DEPT. OF EECS

Winter 2009

Graduate Student Instructor, Digital Integrated Circuits (EECS 312)

Provided instructional support to students by conducting weekly discussion sessions, holding weekly office hours, and helping with preparation of homework and laboratory assignments.

Northwestern University, DEPT. OF EECS

Spring 2008

Teaching Associate, Introduction to Computer Engineering (EECS 203)

Provided instructional support to students by administering and grading weekly laboratory assignments, conducting weekly office hours, and giving occasional lectures when the assigned instructor was unavailable.

OPEN SOURCE
SOFTWARE

[S1] tristate: a Scala Option with both implicit and explicit None.
(<https://github.com/drbuild/tristate/>)

[S2] nscala-money: a Scala wrapper for the Joda Money Java library.
(<https://github.com/nscala-money/nscala-money/>)

[S3] json2yaml: cli utilities for order-preserving conversions between json and yaml.
(<https://github.com/drbuild/json2yaml/>)

- [S4] c2dm4j: a Java library for the Android Cloud to Device Messaging (C2DM) server api (*deprecated*). (<https://github.com/drbuild/c2dm4j/>)
- RESEARCH SOFTWARE
- [S5] The Mason Test: Sybil-detection for ad hoc wireless networks. (<https://github.com/EmbeddedAtUM/mason>)
- [S6] Panappticon: Event-based tracing to measure Android application and platform performance. (<https://github.com/EmbeddedAtUM/panappticon>)
- [S7] 1am: Censorship-resistant microblogging for Android (formerly *Shout*). (<http://1am-networks.org/>)
- [S8] MANES: a Mobile Ad hoc Network Emulation System. (<http://whispercomm.org/manes/>)
- JOURNAL PUBLICATIONS
- [J1] Y. Liu, **D. R. Bild**, R. P. Dick, Z. M. Mao, D. S. Wallach, “The Mason Test: A Defense Against Sybil Attacks in Wireless Networks Without Trusted Authorities,” *IEEE Trans. Mobile Computing*, 14(11):2376–2391, Nov. 2015.
- [J2] **D. R. Bild**, Y. Liu, R. P. Dick, Z. M. Mao, D. S. Wallach, “Aggregate Characterization of User Behavior in Twitter and Analysis of the Retweet Graph,” *ACM Trans. Internet Technology*, 15(1):1–24, Feb. 2015.
- [J3] **D. R. Bild**, G. E. Bok, and R. P. Dick, “Static NBTI Reduction Using Internal Node Control,” *ACM Trans. Design Automation of Electronic Systems*, 17(4):1–30, Oct. 2012.
- CONFERENCE PUBLICATIONS
- [C4] Y. Liu, **D. R. Bild**, D. Adrian, G. Singh, R. P. Dick, Z. M. Mao, D. S. Wallach, “Performance and Energy Consumption Analysis of a Delay-Tolerant Network for Censorship-Resistant Communication,” *Proc. Int. Symp. on Mobile Ad Hoc Networking and Computing*, June 2015.
- [C5] L. Zhang, **D. R. Bild**, R. P. Dick, Z. M. Mao, P. Dinda, “Panappticon: Event-Based Tracing to Optimize Mobile Application and Platform Performance,” *Proc. Int. Conf. Hardware/Software Codesign and System Synthesis*, Sept. 2013.
- [C6] **D. R. Bild**, Y. Liu, R. P. Dick, Z. M. Mao, and D. S. Wallach, “Using Predictable Mobility Patterns to Support Scalable and Secure MANETs of Handheld Devices,” *Proc. Int. Wkshp. Mobility in the Evolving Internet Architecture*, Jun. 2011.
- [C7] **D. R. Bild**, G. E. Bok, and R. P. Dick, “Minimization of Static NBTI Degradation Using Internal Node Control,” *Proc. Design, Automation, and Test in Europe Conf.*, Apr. 2009.
- [C8] **D. R. Bild**, S. Misra, T. Chantem, P. Kumar, R. P. Dick, X. S. Hu, L. Shang, and A. Choudhary, “Temperature Aware Test Scheduling For Multiprocessor Systems-on-Chip,” *Proc. Int. Conf. Computer-Aided Design*, Nov. 2008.
- TECHNICAL REPORTS
- [P9] Y. Liu, **D. R. Bild**, R. P. Dick, “Extending Channel Comparison-based Sybil Detection to MIMO Systems,” Dept. of Electrical Engineering and Computer Science, University of Michigan, Tech. Rep. CSE-TR-584-13, Nov. 2013.
- THESES
- [P10] **D. R. Bild**, “Non-Hierarchical Networks for Censorship-Resistant Personal Communication,” Ph.D. Dissertation, Dept. of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI, USA, Apr. 2014.
- [P11] **D. R. Bild**, “Static NBTI Reduction Using Internal Node Control,” Master’s Thesis, Dept. of Electrical Engineering and Computer Science, Northwestern University, Dec. 2008.
- PAPERS IN PREPARATION
- [P12] **D. R. Bild**, Y. Liu, R. P. Dick, Z. M. Mao, D. S. Wallach, “Performance Analysis of Location Profile Routing”.
- [P13] **D. R. Bild**, R. P. Dick, and S. Prejean, “F_{max} Testing for Integrated Circuits Supporting Dynamic Voltage and Frequency Scaling”.
- INVITED TALKS
- [1] Intel Corporation, Santa Clara, California, *Temperature-Aware Test Scheduling for Multiprocessor Systems-on-Chip*, Nov. 11 2008.
- AD HOC REVIEWER
- ACM Transactions on Embedded Computing (TECS).
ACM Transactions on Design Automation of Electronic Systems (TODAES).
IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD).
IEEE Transactions on VLSI Systems (TVLSI).
IEEE Wireless Communication Letters (WCL).
Social Network Analysis and Mining (SNAM).
Asia and South Pacific Design Automation Conference (ASPDAC).
Design, Automation, & Test in Europe Conference (DATE).

Design Automation Conference (DAC).
International Conference on Computer-Aided Design (ICCAD).
Conference on Computer and Communications Security (CCS).

HONORS AND AWARDS	Cabell Endowment Fellowship, Northwestern University, Evanston, IL.	2007–2008
	Dean’s List, Northwestern University, Evanston, IL.	2004–2007
	National Merit Scholar.	2003–2007
	Tau Beta Pi Engineering Honor Society.	2005
	Eta Kappa Nu ECE Honor Society.	2005
	Eagle Scout, Boy Scouts of America.	2003
	Mathcounts National Competition, represented New Mexico.	1999
PROFESSIONAL SOCIETIES	Institute of Electrical and Electronics Engineers (IEEE).	2008–present
	Association for Computing Machinery (ACM).	2006–present
	Order of the Engineer.	2007
COMMUNITY INVOLVEMENT	Chicago Public Schools Student Science Fair, <i>Judge</i> .	2015–present