David Kebo Houngninou
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Department of Computer Science and Engineering
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EDUCATION	**Ph.D. in Computer Engineering** Southern Methodist University	**December 2017** Dallas, Texas
	Master of Science in Computer Engineering Washington University in St. Louis	**December 2010** St. Louis, Missouri
	Bachelor of Science in Computer Engineering University of Evansville	**December 2008** Evansville, Indiana

AWARDS & CERTIFICATES

Texas A&M Center for Teaching Excellence
Teaching Certificate for Humanizing Education, Learning, and Leadership Online/Offline.

Southern Methodist University, Bobby B. Lyle School of Engineering
Research Days Outstanding Poster Award 2017

MEMBERSHIPS American Society for Engineering Education

RESEARCH "*Implementation of Switching Circuit Models as Vector Space Transformations*"

Modeling of switching circuits is the foundation for many Electronic Design Automation (EDA) tasks and is commonly used at various phases of the design flow for simulation, justification, and other analyses. State-of-the-art simulation tools are based on discrete event algorithms using switching algebraic models and are highly optimized and mature. Symbolic simulation may also be implemented using a discrete event approach or other approaches based on extracted functional models. The common foundation of modern simulation tools is a switching or Boolean algebraic model that may be augmented with timing information. Justification using switching circuit models are often based on solving the satisfiability problem and can be computationally expensive. Alternative models, such as the one proposed here, have the potential to allow for advances in performance and storage requirements in applications such as simulation and justification.

Recently, an alternative foundational model for conventional digital electronic circuits has been proposed where the circuits are modeled as transfer functions in the form of matrices. The new model's novelty represents information as an element in a vector space rather than as a switching function variable. In this way, switching circuits are likewise modeled as transformations from one vector space to another. We demonstrate that the vector space model can be effectively used as the basis for symbolic simulation, justification, and other applications.

PUBLICATIONS D. K. Houngninou and M. A. Thornton, "Simulation of switching circuits using transfer functions," 2017 IEEE 60th International Midwest Symposium on Circuits and Systems (MWSCAS), Boston, MA, 2017, pp. 511-514.

D. K. Houngninou and M. A. Thornton, "Implementation of switching circuit models as transfer functions," 2016 IEEE International Symposium on Circuits and Systems (ISCAS), Montreal, QC, 2016, pp. 2162-2165.

TEACHING EXPERIENCE

Texas A&M University, College Station TX   **August 2018 - Present**
Instructional Assistant Professor
Teaching undergraduate level Computer Science courses in the Department of Computer Science and Engineering.
Courses:

CSCE 110 Programming I
CSCE 222 Discrete Structures for Computing
CSCE 312 Computer Organization

Southern Methodist University, Dallas TX   **August 2015 – May 2018**
Adjunct Lecturer
Microprocessor Architecture and Interfacing
- Taught a course on the ARM Microprocessor Architecture and Interfacing.
- Covered topics such as memory structure and interfacing, bus systems, support chips, tools for hardware design, analysis, simulation, implementation, and debugging.
- Conducted the theoretical part of the course with a laboratory to design and analyze interfaces to processors, memories, and peripherals.

Digital Systems Design
- Taught a course on Digital Systems Design, including combinational logic synthesis using Verilog, FPGA architecture, and finite state machine design.
- Taught the use of HDLs for circuit specification and automated synthesis tools.
- Conducted laboratory experiments and a final design project.

Software Engineering
- Taught an introduction to software system development and an overview of development models and their stages.
- Covered system feasibility and requirements, architecture and design, validation and verification, maintenance, and evolution.
- Taught project management and a review of current software engineering literature.

Discrete Computational Structures
- Taught students how to apply the concepts of discrete mathematics to computer science problems.
- Focused on mathematical principles central to computer science, including sets, logic, and proofs.
- Covered additional topics such as an introduction to graph theory and combinatorics.

INDUSTRIAL EXPERIENCE

Texas Instruments, Dallas TX   **May 2017 - September 2017**
Design Intern
- Worked with the Multicore and DSP team on design and verification.
- Generated SOC system traffic from external masters in a Multicore DSP for IO cache coherence testing.
- Configured PCIe bus and ARM R5 cores as traffic drivers.

IBM Research Lab, Cambridge, MA   **June 2014 - September 2014**
Research Intern
- Performed temporal and structural graph analysis of governance, risk, and compliance data
- Designed and implemented tools for information and Data Visualization

NXP Semiconductors, Austin TX   **May 2012 - August 2012**
Software Developer
- Developed a Web Application for the wafer manufacturing facility
- Developed a dashboard application using the GRAILS framework
- Acquired Professional experience using the DHTMLX JavaScript library

Wirevibe, Irving TX   **January 2011 - October 2011**

Web Developer
- Professional experience in PHP, MySQL, JavaScript, AJAX, and CSS
- Development and maintenance of corporate websites

Magellan Integration, Evansville IN   **August 2008 - May 2010**
Computer Engineer Level 1
- Tested low-voltage equipment before delivery to customers
- Designed and documented security/surveillance systems and low-voltage projects
- Monitored and maintained the company VLANs
- Configured testing lab facilities and maintained Windows & UNIX servers

PROJECTS   **Area: Android OS Application Development**
Android to AXIS IP Cameras

Area: Computer Networking
Design and implementation of a computer network with WAN connectivity for Oncology Hematology Associates of Southwest Indiana

SKILLS

Digital Systems Design	RTL Synthesis and test
Microprocessor Architecture	Embedded Systems Programming
Formal Hardware Verification and Validation	FPGA Architecture

SOFTWARE & OS

Code Composer Studio	Keil μVision	Xilinx ISE	MATLAB
Altera Quartus II	Synopsys Design	NI Multisim	Mac OS X
Cadence Verilog XL	Vision	NI LabVIEW	Linux
	Eclipse IDE		

PROGRAMMING LANGUAGES

Verilog	Assembly	Python
VHDL	C / C++	Java

SERVICE & COMMUNITY OUTREACH

TeamUp Non-Profit, College Station, TX   **August 2018 – Present**
President
TeamUp's mission is to teach engineering and civics to the youths to become active citizens of their communities.

Cercle Social Non-Profit, Dallas, TX   **October 2010 - December 2018**
President
The non-profit for Education donates energy-efficient computers and microcomputers such as the Raspberry Pi in schools in Africa. Our programs give a chance to students in rural and underserved areas to learn the basics of computer software and programming in middle and high school. Our latest project is available on pi.cerclesocial.org.
As President and member of the Board, my responsibilities are the following:
- Oversee the grant writing process to secure funding for educational projects.
- Ensure that the Executive Board's decisions are implemented efficiently.
- Bring innovative ideas to implement our educational programs.
- Oversees the proper functioning of the Organization in the USA and Benin