

Vasil Pano

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- EDUCATION**
- ◇ **Ph.D. — Electrical Engineering** **September 2019**
Drexel University
Thesis: [Wireless Network-on-Chip for Multi-Die Systems](#) Philadelphia, PA
 - ◇ **B.S. — Computer Engineering** **June 2014**
Drexel University Philadelphia, PA
- EXPERIENCE**
- ◇ **Post Doctoral Researcher** **September 2019 – Present**
Drexel University Wireless Systems Laboratory (DWSL) Philadelphia, PA
 - Investigating novel heterogeneous multi-die architectures and adaptive cross-chiplet routing algorithms
 - Implementing custom methodology for optimized mapping of chiplets on a multi-die system utilizing:
 - Event-driven application profiling and characterization framework Prism for workload trace generation
 - gem5-based SynchroTrace replay tool for design-space exploration of non-uniform topologies
 - Evaluating novel TSV-based antenna for efficient and long-distance on-package wireless communication
 - US Patent Application 16/719,536 - “TSV-based on-chip antennas, measurement, and evaluation”
 - Contributed in joint effort on NSF award CNS Core: Small: Wireless Interconnect Networks for Multi-Die Systems.
 - Research coordinator and manager of DWSL providing support and expertise to undergraduate and graduate researchers
 - ◇ **Graduate Research Assistant** **September 2014 – August 2019**
Drexel University VLSI and Architecture Laboratory (VANDAL) Philadelphia, PA
 - Designed and evaluated novel TSV antenna (TSV_A) within a simulated IC environment
 - Targeting the mmWave frequency range (30GHz up to 80GHz evaluated with ANSYS HFSS)
 - Fabricated and tested TSV_A PCB prototype to verify functionality and validate HFSS simulation results
 - Implemented novel NoC architecture that establishes multi-band wireless communication with TSV_As
 - Investigated the scalable interconnect infrastructure of non-monolithic Multi-Die Systems
 - Proposed novel multi-die 3D NoC topology that utilizes the active interposer for die-to-die communication
 - ◇ **Graduate Technical Intern** **June 2016 – January 2017**
Intel Corporation Data Center Group Hillsboro, OR
 - Co-developed Network on Chip simulator for design exploration of on-chip networks and memory.
 - Co-designed and implemented novel memory coherence protocol for large scale multi-processor systems
 - An ACK-less mechanism for software visibility of Store instructions
 - Implemented novel routing algorithm to optimize network performance
 - ◇ **Undergraduate Research Assistant** **June 2013 – July 2014**
Drexel University VLSI & Power-Aware Computing Laboratories Philadelphia, PA
 - Optimized multi-threaded performance of Splash2x workloads and captured traces using custom Valgrind tool
 - Performed design-space exploration and analyzed system performance using the SynchroTrace trace replay tool
- SKILLS**
- ◇ Digital Design, Computer Architecture, Performance and Energy Modeling, Hardware/Software Co-design
 - ◇ C, C++, SystemC, VHDL, SystemVerilog, Python, HFSS, Design Compiler, IC Compiler, Virtuoso
- PUBLICATIONS**
- Journal Publications**
- ◇ R. Kuttappa, B. Taskin, S. Lerner, and V. Pano, “Resonant clock synchronization with active silicon interposer for multi-die systems,” *IEEE Transactions on Circuits and Systems I*, vol. 68, no. 4, pp. 1636–1645, 2021
 - ◇ V. Pano, I. Tekin, I. Yilmaz, Y. Liu, K. Dandekar, and B. Taskin, “TSV Antennas for Multi-Band Wireless Communication,” *IEEE Journal on Emerging and Selected Topics in Circuits and Systems (JETCAS)*, vol. 10, no. 1, pp. 100–113, 2020
 - ◇ V. Pano, I. Tekin, Y. Liu, K. Dandekar, and B. Taskin, “Tsv-based antenna for on-chip wireless communication,” *IET Microwaves, Antennas & Propagation (IET-MAP)*, vol. 14, no. 4, pp. 302–307, 2019

- ◇ R. Kuttappa, A. Balaji, V. Pano, B. Taskin, and H. Mahmoodi, “Rotasyn: Rotary Traveling Wave Oscillator SYNthesizer,” *IEEE Transactions on Circuits and Systems I*, vol. 66, no. 7, pp. 2685–2698, 2019
- ◇ A. More, V. Pano, and B. Taskin, “Vertical arbitration-free 3-D NoCs,” *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, vol. 37, no. 9, pp. 1853–1866, 2017

Conference Publications

- ◇ R. Kuttappa, S. Khoa, L. Filippini, V. Pano, and B. Taskin, “Comprehensive Low Power Adiabatic Circuit Design with Resonant Power Clocking,” in *Proceedings of the IEEE International Symposium on Circuits and Systems (ISCAS)*, pp. 1–5, 2020
- ◇ V. Pano, R. Kuttappa, and B. Taskin, “3D NoCs with Active Interposer for Multi-Die Systems,” in *Proceedings of the IEEE/ACM International Symposium on Networks-on-Chip (NOCS)*, pp. 1–8, 2019
- ◇ R. Kuttappa, B. Taskin, S. Lerner, V. Pano, and I. Savidis, “Robust Low Power clock Synchronization for Multi-Die Systems,” in *Proceedings of the IEEE International Symposium on Low Power Electronics and Design (ISLPED)*, pp. 1–6, 2019
- ◇ V. Pano, I. Tekin, Y. Liu, K. Dandekar, and B. Taskin, “In-Package Wireless Communication with TSV-based Antenna,” in *Proceedings of the IEEE International Symposium on Circuits and Systems (ISCAS)*, pp. 1–3, May 2019
- ◇ V. Pano, S. Lerner, I. Yilmaz, M. Lui, and B. Taskin, “Workload-Aware Routing (WAR) for Network-on-Chip Lifetime Improvement,” in *Proceedings of the IEEE International Symposium on Circuits and Systems (ISCAS)*, pp. 1–5, May 2018
- ◇ S. Lerner, V. Pano, and B. Taskin, “NoC Router Lifetime Improvement using Per-Port Router Utilization,” in *Proceedings of the IEEE International Symposium on Circuits and Systems (ISCAS)*, pp. 1–5, May 2018
- ◇ V. Pano, Y. Liu, I. Yilmaz, A. More, B. Taskin, and K. Dandekar, “Wireless NoCs Using Directional and Substrate Propagation Antennas,” in *Proceedings of the IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, pp. 188–193, July 2017
- ◇ V. Pano, I. Yilmaz, Y. Liu, B. Taskin, and K. Dandekar, “Wireless Network-on-Chip analysis of propagation technique for on-chip communication,” in *Proceedings of the IEEE International Conference on Computer Design (ICCD)*, pp. 400–403, October 2016
- ◇ V. Pano, I. Yilmaz, A. More, and B. Taskin, “Energy aware routing of multi-level Network-on-Chip traffic,” in *Proceedings of the IEEE International Conference on Computer Design (ICCD)*, pp. 480–486, October 2016
- ◇ Y. Liu, V. Pano, D. Patron, K. Dandekar, and B. Taskin, “Innovative propagation mechanism for inter-chip and intra-chip communication,” in *Proceedings of the IEEE Annual Wireless and Microwave Technology Conference (WAMICON)*, pp. 1–6, April 2015

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| PROFESSIONAL
ACTIVITIES | ◇ Graduate Student Supervisor (Angela Wei) - Non-uniform Wireless Multi-Die Systems | 2019 - Present |
| | ◇ Graduate Student Supervisor (Isikcan Yilmaz) - NoC & gem5 related research | 2015 - 2019 |
| | ◇ Senior Design Projects Mentor: The VarIoT Hub, Radio Arena, DVT Prevention Device | 2019 - Present |
| | ◇ Reviewer of ACM Journal on Emerging Technologies in Computing Systems, Elsevier Microelectronics Journal, IEEE International Symposium on Nanoelectronic and Information Systems, Elsevier Integration Journal, Sustainable Computing, Informatics and Systems | |

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| ACADEMIC
HONORS AND
AWARDS | ◇ Drexel ECE Nihat Bilgutay Award (“High Academic Achievement”), 2017, 2018 |
| | ◇ Drexel College of Engineering Outstanding Mentorship Award, 2018 |
| | ◇ Drexel University Dean’s List, Dean’s Scholarship, Endowed Scholarship, (multiple instances) |

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| REFERENCES | ◇ Dr. Baris Taskin
Professor, Department of ECE
Drexel University, Philadelphia, PA
E-mail: taskin@coe.drexel.edu | ◇ Dr. Ibrahim Tekin
Professor, Department of EE
Sabanci University, Istanbul, Turkey
E-mail: tekin@sabanciuniv.edu |
| | ◇ Dr. Kapil R. Dandekar
Professor & Associate Dean, Department of ECE
Drexel University, Philadelphia, PA
E-mail: dandekar@drexel.edu | ◇ Dr. Ankit More
Principal Engineer
Microsoft, San Francisco, CA
E-mail: ankitmore@gmail.com |