Vasil Pano

Philadelphia, PA | 215-512-1519 | vasilpano@gmail.com | linkedin.com/in/vasilpano

EDUCATION

◇ **Ph.D. — Electrical Engineering** **September 2019**
Drexel University Philadelphia, PA
Thesis: Wireless Network-on-Chip for Multi-Die Systems

◇ **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

◇ 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: Regular Papers*, 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

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

Academic Honors and Awards

- Drexel ECE Nihat Bilgutay Award ("High Academic Achievement"), 2017, 2018
- Drexel College of Engineering Oustanding Mentorship Award, 2018
- Drexel University Dean's List, Dean's Scholarship, Endowed Scholarship, (multiple instances)

References

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