

# David Blaauw

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## Education

### University of Illinois, Urbana-Champaign

Ph.D. Computer Science, 1992

### Duke University, Durham, NC

B.S. Physics and Computer Science, 1986

## Professional Experience

<b>Kensall D. Wise Collegiate Professor of EECS</b> , University of Michigan, Ann Arbor, MI	2001 – present
<b>Co-founder</b> , DASH Tech Integrated Circuits, Inc.	2020
<b>Co-founder</b> , Cubeworks, Ann Arbor, MI	2014
<b>Co-founder</b> , Ambiq, Austin, TX	2010
<b>Engineering Manager</b> , Motorola, Inc., Austin, TX	1993 – 2001
<b>Development Staff Member</b> , IBM Corporation, Endicott, NY	1992 – 1993

## Selected Honors and Awards

- 2023 IEEE Solid-State Circuits Conference (ISSCC), Ranked 2nd Top Contributing Author in first 70 years of conference
- 2023 International Symposium on Computer Architecture (ISCA), 25 years retrospective best paper award for year 2018
- 2022 Symposium on Microarchitecture (MICRO) and Symposium on Computer Architecture (ISCA), Hall of Fame for 8+ papers
- 2021 Symposium on Microarchitecture (MICRO), Test of Time award for most impactful paper 18-22 years after publication
- 2017 IEEE VLSI Circuits Symposium, Top Contributing Author over the last 30 years of the conference with 38 publications
- 2017 Symposium on Computer Architecture (ISCA), 15 year retrospective most influential paper award
- 2016 Semiconductor Industry Association (SIA) and Semiconductor Research Corporation (SRC), University Researcher Award for lifetime contribution to the U.S. semiconductor industry by university faculty (one award per year for circuits)
- 2014 Recognized as top 50 innovator over the last 50 years graduating from the University of Illinois EECS department
- 2013 Design Automation Conference (DAC) 50th Anniversary award for being among top 10 most cited author in 50 year history
- 2012 IEEE Fellow status “for contributions to adaptive and low power circuit design”

## Selected Professional Activities and Service

- IEEE International Solid-State Circuits Conference (ISSCC), Member technical program committee, 2006 – 2009, 2018 – 2022
- ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED), Executive committee, 1999 – 2006
- ACM/IEEE Design Automation Conference (DAC), Member executive committee, 2001 – 2003
- ACM/IEEE Design Automation Conference (DAC), Co-Chair technical program committee, 2001 – 2002
- ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED), General Co-Chair, 2000

## Grants and Contracts Summary

Over 90 grants and contracts from government and industry totaling \$40M US to my research group including:

- National Institutes of Health (NIH), “Optical Neural Motes Enable High Density Recording,” \$2,572,751, Co-lead PI, 2022–2025
- Ministry of Defense “Michigan-Micro-Mote Audio-Logger,” \$2,765,462, lead PI, 2019 – 2024
- Leidos, “Small Acoustic Sensors and Switch,” \$2,812,300, lead-PI, 2017 – 2021
- National Science Foundation, “Reclaiming Moore’s Law through Ultra Efficient Computing,” \$2,778,507, lead PI, 2009 – 2014

## Patent Summary

74 patents issued, licensees include ARM, Ambiq, Mythic, Cubeworks, and DASH Tech. Examples include:

- Mingoo Seok, Dennis Sylvester, David Blaauw, Scott Hanson, and Gregory Chen, "Reference voltage generator having a two transistor design," US patent 8,564,275, 2013. [Foundational patent for Ambiq, used in >200M production chips shipped]
- David Blaauw, David Bull, Sidhartha Das, "Error recovery within processing stages of an integrated circuit," US Patent 7,320,091, 2008. [Patent licenced to Arm, Ltd. Cited 95 times]
- Larry G Jones, David T Blaauw, Robert L Maziasz, Mohan Guruswamy, "Method and apparatus for designing an integrated circuit," US Patent 5,666,288, 1997. [Assigned to Motoral Inc., Cited 148 times]

## Publication Summary

10 books and book chapters, 194 journal articles, and > 450 peer-reviewed conference papers including > 40 invited papers and 13 best paper awards or nominations. h-index of 107 and total citation count of > 46,000.

Among the innovations in these papers are the lowest power voltage reference (Seok 2012), the lowest noise efficiency factor amplifier (Chen 2014), the first derivation of the energy-optimal supply voltage in general CMOS digital circuits (Zhai 2004), the first cubic-mm computing system (Chen 2011), the first experimental demonstration of in-memory computing using 6T SRAM (Jeloka 2015), the first Razor system using timing speculation based voltage scaling (Ernst, 2003), first near-threshold voltage based computation (Dreslinski, 2010).

Selection of most cited papers:

- Nam Sung Kim, Todd Austin, David Baauw, Trevor Mudge, Krisztián Flautner, Jie S Hu, Mary Jane Irwin, Mahmut Kandemir, Vijaykrishnan Narayanan, "Leakage current: Moore's law meets static power," computer, 2003, citations: **1804**
- Dan Ernst, Nam Sung Kim, Shidhartha Das, Sanjay Pant, Rajeev Rao, Toan Pham, Conrad Ziesler, David Blaauw, Todd Austin, Krisztian Flautner, Trevor Mudge, "Razor: A low-power pipeline based on circuit-level timing speculation," IEEE/ACM International Symposium on Microarchitecture, (MICRO), 2003, citations: **1796**
- Krisztián Flautner, Nam Sung Kim, Steve Martin, David Blaauw, Trevor Mudge, "Drowsy caches: simple techniques for reducing leakage power," ACM SIGARCH Computer architecture news, 2002, citations: **1236**
- Ronald G Dreslinski, Michael Wieckowski, David Blaauw, Dennis Sylvester, Trevor Mudge, "Near-threshold computing: Reclaiming moore's law through energy efficient integrated circuits," Proceedings of the IEEE , 2010, citations: **1158**
- Bo Zhai, David Blaauw, Dennis Sylvester, Krisztian Flautner, "Theoretical and practical limits of dynamic voltage scaling," ACM/IEEE Design Automation Conference, 2004, citations: **559**
- Charles Eckert, Xiaowei Wang, Jingcheng Wang, Arun Subramaniyan, Ravi Iyer, Dennis Sylvester, David Blaauw, Reetuparna Das, "Neural cache: Bit-serial in-cache acceleration of deep neural networks," International Symposium on Computer Architecture (ISCA), 2018, citations: **469**
- Mingoo Seok, Gyouho Kim, David Blaauw, Dennis Sylvester, "A portable 2-transistor picowatt temperature-compensated voltage reference operating at 0.5 V," IEEE Journal of Solid-State Circuits, 2012, citations: **467**