Eugenio Culurciello, PhD

Entrepreneur • Leader • Engineer • Teacher

~ Teaching machines how to learn ~

Email: culurciello@gmail.com, euge@purdue.edu
Web: https://culurciello.github.io | LinkedIn | Blog | e-Lab

EXECUTIVE SUMMARY

AI pioneer bridging academic research with commercial impact. Recipient of the Presidential Early Career Award for Scientists and Engineers (PECASE), the highest US government honor for early-career scientists. Serial entrepreneur with successful exit to Micron Inc. Designed 5 generations of deep learning processors and 32+ integrated circuits. Currently Full Professor at Purdue University and founding Director of the Purdue Institute of Physical AI (IPAI). Proven track record leading teams of 10-100+ across startups, Fortune 500 companies, and academia.

PROFESSIONAL INTEREST

- AI Infrastructure, cloud computing, computing clusters, inference and serving AI, Deep Learning, Neural Networks, Machine Learning
- Multi-modal Large Language Models, knowledge graphs, AGI, Document Understanding
- Artificial intelligence for edge devices, robots, 3D graphics, artificial vision
- Learning in unstructured environments, unsupervised and reinforcement learning

HIGHLIGHTS

- **Presidential Early Career Award for Scientists and Engineers (PECASE) – highest US government honor for early-career scientists**
- Designed 5 generations of deep learning processors (2006-2022) and 32+ integrated circuits with published results
- Serial entrepreneur: founded FWDNXT (2017, acquired by Micron Inc. 2019) and Teradeep (2013)
- Director of the Purdue Institute of Physical AI (IPAI), 2023-2024
- 2019 Most Impactful Inventors of FY19, Purdue Engineering Office of Technology and Commercialization
- Business leader: CEO, CTO, Head of AI in multiple companies; managed teams of 10+ direct and up to 100 indirect reports
- Head of Machine Intelligence, Movidius (Intel company), June 2016 - January 2017
- Distinguished Lecturer, IEEE Circuits and Systems Society
- Keynote speaker at System-On-A-Chip Conference (2017, 2011)
- Expert in VLSI analog/mixed-signal design, digital SoC, biomedical instrumentation, product development
- Featured in MIT Technology Review, BBC, Business Insider, and 15+ major media outlets

EDUCATION

- **PhD, Electrical and Computer Engineering**, The Johns Hopkins University, September 2004
  Thesis: "Silicon on Sapphire CMOS Circuits and Devices for Sensor Interfaces"
- **M.S., Electrical and Computer Engineering**, The Johns Hopkins University, May 1999
- **M.S., Electrical Engineering**, University of Trieste, Italy, July 1997

PROFESSIONAL EXPERIENCE

- **Purdue University, Full Professor**, August 2023 - present
- **Pascaline Systems Inc., CTO**, May 2024 - December 2024
- **Micron Inc., Fellow (Machine Learning, Deep Learning, AI)**, July 2019 - July 2022
- **FWDNXT Inc., Founder, CTO and President**, January 2017 - July 2019 (acquired by Micron)
- **Intel Movidius, Head of Machine Learning**, April 2016 - December 2016
- **Teradeep Inc., Founder, CEO, CTO**, December 2013 - April 2016
- **Purdue University, Associate Professor with tenure**, August 2011 - July 2022
- **EC Consulting, AI and Deep Learning**, January 2008 - present
- **Yale University, Associate Professor**, Director of e-Lab VLSI Laboratory, July 2004 - July 2011
- **The Johns Hopkins University, PhD Research Assistant**, Sensory Communication & Microsystems Lab, January 1998 - July 2004

TECHNICAL EXPERTISE

Machine Learning & AI:
Neural networks and deep learning, supervised/unsupervised/reinforcement learning, continual learning, multi-modal LLMs, computer vision (object recognition, tracking, categorization), NLP, sequence learning

AI Hardware & Architecture:
Custom AI accelerators, FPGA development (Xilinx), DSP optimization, MAC unit design, systolic arrays, dataflow architectures, SoC integration, hardware-software co-design

Cloud & Infrastructure:
AWS, Google Cloud, Docker, Kubernetes, Airflow, Kubeflow, orchestration, AI inference serving

Development Tools:
Python, C/C++, Lua, CUDA, PyTorch, TensorFlow, Torch7; AI coding assistants (Cursor, Aider, Windsurf, Ollama); Verilog, VHDL, Xilinx FPGA tools; Cadence, Synopsis, Spice

Chip Design:
VLSI analog/mixed-signal design, SoC development, EKV modeling, Tanner L-Edit, circuit simulation (Spectre, Hspice)

Additional:
3D graphics (BabylonJS), robotics, visual programming (LiteGraph, Blockly), video game design

HONORS & AWARDS

1. Presidential Early Career Award for Scientists and Engineers (PECASE) 2009 – highest US government honor for early-career scientists
2. Distinguished Lecturer of the IEEE, Circuits and Systems Society 2011-2012
3. Keynote address, SoC Conference 2017 and 2011
4. Best Paper Award, IEEE Circuits and Systems Society, ISCAS 2008
5. Yale Associate Faculty Fellowship, 2010
6. Yale Junior Faculty Fellowship, 2008
7. Invited to National Academies NAFKI Complex Systems Conference, 2008
8. Microsoft Research Faculty Summit invitee, 2013
9. Best poster award, 14th Annual CMOC Symposium, Yale University, 2005

PUBLICATIONS

Full publication list available at: http://e-lab.github.io/publications.html

TEACHING EXPERIENCE

10. BME495 Deep Learning for Medical Imaging, 400-level, Spring 2016-2025
11. BME595 Entrepreneurship, Fall 2022
12. BME595 Deep Learning, 500-level, Fall 2015-2018
13. BME 528/ECE 528 – Measurement & Stimulation of the Nervous System, Spring 2015
14. BME 495 Computational Neuroscience and Learning, Spring 2014
15. BME595 Artificial and Robotic Vision, Spring 2013
16. BME 301 Bioelectricity, Fall 2012-2013
17. BME 595 Neuromorphic Systems and Synthetic Vision, Spring 2012
18. Additional courses at Yale University (2005-2011): Advanced Integrated Circuits, Digital Systems, Sensors and Biosensors, Silicon on Sapphire devices

INDUSTRY COLLABORATIONS

Entrepreneur at heart with a passion to take discoveries from lab to global commercialization. Experienced in leading small teams to achieve what large companies cannot. Solid experience in raising rounds, M&A, licensing, mentoring, and partnering with Fortune 500 companies.

Commercial Partners: Micron, AMD, Amazon, Google, Meta, Qualcomm, Samsung, Apple, Intel, Movidius, Nervana Systems, Continental, Valeo, John Deere, Synopsis, Cadence, Silanna Semiconductors, Warner Instruments, Red Shirt Imaging

Government/Defense: ONR, DOE, Navy, Army, Air Force, DARPA, PNNL, CERN; Contractors: Northrop Grumman, MITRE, In-Q-Tel, Irvine Sensors, Trident

Academic: Collaborated with Yann LeCun (NYU/Meta), Fred Sigworth (Yale), Vincent Pieribone (Yale), Ernst Niebur (Johns Hopkins)

SELECTED GRANTS & FUNDING

Total research funding secured: $10M+ across federal grants, corporate partnerships, and startup capital

- ONR grant on robotics brains and physical AI learning, DURIP add-on, 2023-2026
- FWDNXT Inc.: Raised >$2M (2017-2019), acquired by Micron Inc. June 2019
- SRC C-BRIC: Center for Brain-inspired Computing, $1.2M to group (2017-2022)
- ONR: Software and hardware for deep learning, $800,000 (2015-2019)
- Teradeep Inc.: Raised $1.5M from Xilinx Inc., December 2015

- NIH: High-Speed fluorescent imaging of cortex, $1.17M (2012-2016)
- ONR PECASE: Trillion Operations-Per-Second Vision System, $1M (2011-2015)
- ONR MURI: Figure-Ground Processing and Attention, $463K (2009-2014)
- NSF IDBR: High-Throughput Patch-clamp Instrumentation, $660K (2011-2014)
- Google Research Award: Hardware-accelerated vision system, $57.5K (2012-2013)

PROFESSIONAL ACTIVITIES

- Embedded Vision Alliance Research Advisory Board (2015-2017)
- IEEE Senior Member since 1993
- Conference organization: ISCAS 2017 (sponsorship chair), ICLR 2013 (early open-review system), IEEE BioCAS (tutorials/demo chair)
- IEEE Committees: Sensory Systems, Biomedical Circuits, Neural Networks Technical Committees
- Associate Editor: IEEE Trans. Biomedical Circuits and Systems, PLoS ONE Synthetic Vision Systems
- Reviewer: NSF, NSERC (Canada), QNRF (Qatar), RGC (Hong Kong), major IEEE journals
- Neuromorphic Engineering Workshop at Telluride, CO (2001, 2004, 2006, 2009, 2013)

UNIVERSITY SERVICE

- Director, Purdue Institute of Physical AI (IPAI), 2023-2024
- ML@Purdue student group advisor (700+ members), 2023-present
- Purdue BME Department steering committee on Center for Digital Health, 2023
- Data Science Initiative, Purdue College of Engineering panels, 2018
- Purdue University robotics group coordinator, 2012-2013
- Undergraduate/Graduate Curriculum committees, Yale and Purdue

SELECTED INVITED TALKS (70+ total)

- ORNL Cross Correlation Distinguished Lecture Series, "AI for nothing and brains for free", 2023
- Micron Japan AI and Machine Intelligence Seminar, 2020
- Embedded Vision Summit (multiple talks), 2017-2018
- NAVAIR, "Hardware for Deep Learning", Point Mugu, 2018
- Design Automation Conference, "Low-Power Image Recognition", 2016
- Google (Mountain View & NYC), "Modeling the human visual system in hardware", 2012-2013
- Qualcomm San Diego (multiple visits), 2013-2014
- Samsung Korea, NYU, MIT, Columbia, Stanford, and 50+ other institutions

TEAM LEADERSHIP

Supervised 15+ PhD students, 10+ postdocs, and numerous MS/undergraduate researchers. Built and managed FWDNXT team of 10 engineers (compiler, ML, hardware). Key team members placed at Micron, Amazon, Google TPU, NVIDIA, Apple, and academic positions.

Current Team:

- Sravani Ramishetty, PhD student at Purdue

Notable Alumni (first positions):

- Shakti Wadekar → Chaos Industries
- Alfredo Canziani → NYU postdoc with Yann LeCun
- Vinay Gokhale → Google TPU team → AMD
- Aysegul Dundar → NVIDIA → Professor in Turkey
- Jonhoon Jin → Lighthouse AI → Apple Inc.
- Wei Tang → Assistant Professor, University of New Mexico
- Shoushun Chen → Assistant Professor, NTU Singapore

PERSONAL

Languages: Fluent in English and Italian; basic Korean and Chinese
Citizenship: United States, Italy (European Union)