SUBIR VARMA

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SUMMARY

Tech. industry veteran with experience of working in both large companies as well as start-ups. Author of "Internet Congestion Control", published by Morgan Kaufmann/Elsevier in Aug 2015. Co-founder of Aperto Networks and chief architect for their Packetwave line of Broadband Wireless Access products. Served as CTO and VP Engineering at Aperto and played an integral role in Aperto's progress from a new start-up to more than $20 million in annual sales. Chaired the MAC group of the IEEE802.16 standard's body at the time when it was developing the WiMAX specification. Holder of 50+ US Patents in the areas of high-speed networking and broadband access.

Teaching Experience: Taught Graduate Level courses in "Deep Learning" (Fall, 2017) and "Reinforcement Learning" (Summer, 2018) in the Computer Engineering Dept. at SCU.

EDUCATION

- Ph.D. in Electrical Engineering (1990), *University of Maryland, College Park*
  Thesis: "Heavy and Light Traffic Approximation for Queues with Synchronization Constraints."
- M.S. in Electrical Engineering (1987), *University of Maryland, College Park*
  Thesis: "Some Problems in Queues with Resequencing."
- B.Tech. in Electrical Engineering (1985, JEE Rank of 61), *Indian Institute of Technology, Kanpur*

WORK EXPERIENCE

Catapulse Partners, Palo Alto, CA **2012 –**
Co-Founder and Vice President

- Providing Technical and Management consulting for some of the premier start-ups in Silicon Valley. Clients have included companies such as LinkedIn, Google, Twitter, Marketo, Coursera, Flipkart.

Tellabs Inc/Wichorus, Santa Clara, CA **2008 – 2012**
Global CTO Group, Senior Principal Architect

- Wichorus was an industry leader in the area of intelligent wireless gateways for 4G networks, it was acquired by Tellabs in 2009. Led Wichorus's projects in the Femto Cell and Pico Cell Networking areas including Product Requirements, Definitions and Partnerships.
- Worked on next generation technology for LTE/WiMAX packet core and Mobile Backhaul networks. Architected the LTE WLAN Offload solution and created a Products Requirements Document based on the design. Contributed to the architecture of OpenFlow

and Software Defined Networking concepts to LTE mobile backhaul networks. Represented Tellabs at the 3GPP SA2 Body which sets LTE Standards.

Sprint Nextel Corp, Herndon, VA **2007 – 2008**
Technology Development Strategist

- Consulted for the XoHM division within Sprint Nextel, helping them with vendor relations and technology development required for the industry's first WiMAX network deployment.

Aperto Networks, Milpitas, CA **1999 – 2007**
Co-Founder
Vice President of Technology
Vice President of Engineering

- Aperto was a pioneer in the Broadband Wireless space. It developed and sold an end-to-end wireless access system, consisting of Base Station and Client Units. Development involved all the Hardware and Software systems, all the way from proprietary ASICs to Network Management software. The company took part in the IEEE 802.16 Standard's Body and significantly influenced the WiMAX standard.
- During the initial phase of the company, led the Technology and Systems Architecture efforts and was responsible for defining the technical and product specifications for the Packetwave family of BWA products. Took part in recruiting the technical team in the company of more than 70, and oversaw the day-to-day engineering implementation of the product. Designed patented system algorithms that differentiated the product, and supervised the development of a comprehensive OPNET model that was used to optimize these algorithms.
- Managing the Engineering team in the latter phase of the company. Responsible for the Engineering execution in developing the PacketMax family of products, which is based on the IEEE 802.16d WiMAX standard. Aperto commenced work on this product about 6 months to a year behind the competition, and yet was among the first wave of companies to certify the product with the WiMAX forum, in January 2006.

Hybrid Networks, San Jose, CA **1996 – 1999**
Director, Systems Architecture

- Hybrid Networks was one of the first companies to work on Cable Modem systems and was also a pioneer in Fixed Broadband Wireless Access.
- Lead System Architect for the Hybrid System 2000, one of the first two-way cable and wireless broadband access system and inventor of the innovative MAC protocol. Represented Hybrid at Cable Labs and took part in the standardization of the Cable Modem industry, initially in IEEE 802.14 and later as part of the DOCSIS consortium.
- Responsible for optimizing the performance of all Hybrid's products to best of breed in the industry, through extensive theoretical analysis of TCP flow control in asymmetric networks, followed by practical application to pertinent algorithms.

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LSI Logic Corporation, Milpitas, CA **1995 – 1996**
Senior Systems Engineer, Communications Products Division

- Lead ATM Architect for the Communications Products Division. Responsible for charting the technical direction of the group. Designed the Traffic Management sub-system for the ATMizer-II SAR engine. Represented LSI Logic at the meetings of the ATM Forum and the IEEE 802.14 committee. Authored two widely cited inventions in the areas of high speed switch design and ATM SAR design.

IBM Corporation, Research Triangle Park, NC **1990 – 1995**
Advisory Architect, Emerging Technologies Group

- Responsible for the next generation Bandwidth Management and QOS support in IBM's ATM based Networking Broadband Services (NBBS) architecture. Developed new scheduling algorithms for providing delay and jitter guarantees for real-time traffic. Designed techniques for improving the data transfer efficiency of networking protocol software. Won an IBM Outstanding Technical Achievement Award for this work.

SELECTED PUBLICATIONS WITH CITATIONS

1. US Patent #5,831,980: "Shared memory fabric architecture for high speed ATM switches." **Number of Citations: 135**.

2. *US Patents #5,920,561, #5,982,749, #6,535,512*: "ATM Communication system interconnect/termination unit." **Number of Citations: 167**.

3. *US Patent #5,796,719*: "Traffic flow regulation to guarantee end-to-end delay in packet switched networks." **Number of Citations: 179**.

4. *S. Varma and A. Makowski*: "Interpolation approximations for symmetric fork-join queues." Performance Evaluation, (1994). **Number of Citations: 83**.

5. *US Patent #5,959,993*: "Scheduler design for ATM switches and its implementation in a distributed shared memory architecture." **Number of citations: 42**.

6. *US Patent # 6,275,497*: "Method and apparatus for controlling communications channels using contention and polling schemes." **Number of citations: 35**.

7. *US Patent #5,621,773*: "Method and apparatus for fast synchronization of T1 extended superframes." **Number of citations: 29**.

8. *US Patents #6,643,322, #6,947,479*: "Dynamic wireless link adaptation." **Number of citations: 23**.

9. *S. Varma*, "MPEG-2 over ATM: System design issues, " IEEE COMPCOM. **Number of citations: 23**.

10. *S. Varma,* "Performance and buffering requirements of TCP applications in asymmetric networks," IEEE INFOCOM 1999. **Number of citations: 13**.