# Tal Lavian, Ph.D.



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# Research and Consulting: Telecommunications, Network Communications, and Mobile Wireless technologies

- Scientist, educator, and technologist with over 25 years of experience
- Co-author on over 25 scientific publications, journal articles, and peer-reviewed papers
- Named inventor on over 80 issued and filed patents
- Industry fellow and lecturer at UC Berkeley Engineering Center for Entrepreneurship and Technology (CET)

# EDUCATION

- Ph.D., Computer Science specializing in networking and communications, UC Berkeley
- M.Sc., Electrical Engineering, Tel Aviv University
- B.Sc., Mathematics and Computer Science, Tel Aviv University

## EXPERTISE

Network communications, telecommunications, Internet protocols and mobile wireless:

- **Communication networks:** Internet Protocols; TCP/IP suite; TCP; UDP; IP; VoIP; Ethernet; network protocols; network software applications; Data Link, Network, and Transport Layers (L2, L3, L4)
- Internet Software: Internet software applications; distributed computing; cloud computing; Web applications; FTP; HTTP; Java; C; C++; client server; file transfer; multicast; streaming media
- **Routing/switching:** LAN; WAN; VPN; routing protocols; RIP; BGP; MPLS;OSPF; IS-IS;DNS; QoS; switching; packet switching; network infrastructure; network communication architectures
- **Mobile Wireless:** Wireless LAN; 802.11; cellular systems; mobile devices; smartphone technologies

# LITIGATION SUPPORT SERVICES

- Expert witness in numerous USPTO PTAB Inter Partes Review (IPR) and CBM cases
- Expert witness in Federal courts and the ITC (over 30 cases)
- Expert reports, depositions, and courtroom testimonies
- Skilled articulation of technical material for both technical and non-technical audiences
- Product and technology analysis, patent portfolios, claim charts, patentability research
- Litigation support and technology education in patent disputes
- Past cases involved Cisco, Juniper, HP, Ericsson, Microsoft, Google, Samsung and Apple

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#### ACCOMPLISHMENTS

- Selected as Principal Investigator for three US Department of Defense (DARPA) projects
- Led research project on networking computation for the US Air Force Research Lab (AFRL)
- Led and developed the first network resource scheduling service for grid computing
- Led wireless research project for an undisclosed US federal agency
- Managed and engineered the first demonstrated transatlantic dynamic allocation of 10Gbs Lambdas as a grid service

2000-Present

- Spearheaded the development of the first demonstrated wire-speed active network on commercial hardware
- Invented over 80 patents; over 50 prosecuted pro se in front of the USPTO
- Created and chaired Nortel Networks' EDN Patent Committee
- Current IEEE Senior Member

#### **PROFESSIONAL EXPERIENCE**

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University of California, Berkeley, Berkeley, CA Berkeley Industry Fellow, Lecturer, Visiting Scientist, Ph.D. Candidate, Nortel's Scientist Liaison

Some positions and projects were concurrent, others sequential

- Serves as an Industry Fellow and Lecturer at the Center for Entrepreneurship and Technology (CET).
- Studied network services, telecommunication systems and software, communications infrastructure, and data centers
- Developed long-term technology for the enterprise market, integrating communication and computing technologies
- Conducted research projects in data centers (RAD Labs), telecommunication infrastructure (SAHARA), and wireless systems (ICEBERG)
- Acted as scientific liaison between Nortel Research Lab and UC Berkeley, providing tangible value in advanced technologies
- Earned a Ph.D. in Computer Science with a specialization in communications and networking

#### **Telecomm Net Consulting, Inc.** (Innovations-IP) Sunnyvale, CA 2006-Present **Principal Scientist**

 Consulting in the areas of network communications, telecommunications, Internet protocols, and smartphone mobile wireless devices

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- Providing architecture and system consultation for software projects relating to computer ٠ networks, mobile wireless devices, Internet web technologies
- Acting as an expert witness in network communications patent infringement lawsuits

#### VisuMenu, Inc. – Sunnyvale, CA

## Co- Founder and Chief Technology Officer (CTO)

- Design and develop architecture of visual IVR technologies for smartphones and wireless mobile devices in the area of network communications
- Design crawler/spider system for IVR / PBX using Asterisk, SIP and VoIP •
- Deploy the system as cloud networking and cloud computing utilizing Amazon Web Services (EC2, S3, VPC, DNS, and RDS)

#### Ixia, Santa Clara, CA **Communications Consultant**

- Researched and developed advanced network communications testing technologies:
  - IxNetwork/IxN2X tests IP routing and switching devices and broadband access equipment. Provides traffic generation and emulation for the full range of protocols: routing, MPLS, layer 2/3 VPNs, Carrier Ethernet, broadband access, and data center bridging.
  - IxLoad guickly and accurately models high-volume video, data, and voice subscribers and servers to test real-world performance of multiservice delivery and security platforms.
  - IxCatapult emulates a broad range of wireless access and core protocols to test wireless components and systems. When combined with IxLoad, provides an end-to-end solution for testing wireless service quality.
  - IxVeriWave employs a client-centric model to test Wi-Fi and wireless LAN networks by generating repeatable large-scale, real-world test scenarios that are virtually impossible to create by any other means.
  - Test Automation provides simple, comprehensive lab automation to help test engineering teams create, organize, catalog, and schedule execution of tests.

## Nortel Networks, Santa Clara, CA

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Originally employed by Bay Networks, which was acquired by Nortel Networks Principal Scientist, Principal Architect, Principal Engineer, Senior Software Engineer

Held scientific and research roles at Nortel Labs, Bay Architecture Labs, and in the office of the CTO

#### 2008-2008

2010-Present

1996 - 2007

#### Principal Investigator for US Department of Defense (DARPA) Projects

- Conceived, proposed, and completed three research projects: Active Networks, DWDM-RAM, and a networking computation project for Air Force Research Lab (AFRL)
- Led a wireless research project for an undisclosed US federal agency

#### Academic and Industrial Researcher

- Analyzed new technologies to reduce risks associated with R&D investment
- Spearheaded research collaboration with leading universities and professors at UC Berkeley, Northwestern University, University of Amsterdam, and University of Technology, Sydney
- Evaluated competitive products relative to Nortel's products and technology
- Proactively identified prospective business ideas, which led to new networking products
- Predicted technological trends through researching the technological horizon and academic sphere
- Developed software for switches, routers and network communications devices
- Developed systems and architectures for switches, routers, and network management
- Researched and developed the following projects:

<ul> <li>Data-Center Communications: network and server orchestration</li> <li>DRAC: SOA-facilitated L1/L2/L3 network dynamic controller</li> <li>Omega: classified wireless project for undisclosed US Federal Agency</li> <li>Open Platform: project for the US Air Force Research Laboratory (AFRL)</li> </ul>	2006-2007 2003-2007 2006 2005
<ul> <li>Network Resource Orchestration for Web Services Workflows</li> </ul>	2004-2005
<ul> <li>Proxy Study between Web/Grids Services and Network Services</li> </ul>	2004
<ul> <li>Streaming Content Replication: real-time A/V media multicast at edge</li> </ul>	2003-2004
<ul> <li>DWDM-RAM: US DARPA-funded program on agile optical transport</li> </ul>	2003-2004
<ul> <li>Packet Capturing and Forwarding Service on IP and Ethernet traffic</li> </ul>	2002-2003
<ul> <li>CO2: content-aware agile networking</li> </ul>	2001-2003
<ul> <li>Active Networks: US DARPA-funded research program</li> </ul>	1999-2002
<ul> <li>ORE: programmable network service platform</li> </ul>	1998-2002
<ul> <li>JVM Platform: Java on network devices</li> </ul>	1998-2001
<ul> <li>Web-Based Device Management: network device management</li> </ul>	1996-1997

#### **Technology Innovator and Patent Leader**

- Created and chaired Nortel Networks' EDN Patent Committee
- Facilitated continuous stream of innovative ideas and their conversion into intellectual property rights
- Developed intellectual property assets through invention and analysis of existing technology portfolios

#### Aptel Communications, Netanya, Israel

#### Software Engineer, Team Leader

Start-up company focused on mobile wireless CDMA spread spectrum PCN/PCS

- Developed a mobile wireless device using an unlicensed band [Direct Sequence Spread Spectrum (DSSS)]
- Designed and managed a personal communication network (PCN) and personal communication system (PCS), the precursors of short text messages (SMS)
- Designed and developed network communications software products (mainly in C/C++)
- Brought a two-way paging product from concept to development

#### Scitex Ltd., Herzeliya, Israel

#### Software Engineer, Team Leader

Software and hardware company acquired by Hewlett Packard (HP)

- Developed system and network communications (mainly in C/C++)
- Invented Parallel SIMD Architecture
- Participated in the Technology Innovation group

#### Shalev, Ramat-HaSharon, Israel

Start-up company

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#### **Software Engineer**

• Developed real-time software and algorithms (mainly in C/C++ and Pascal)

1987-1990

1990-1993

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