



Founder, AiRANACULUS  
Former Chairman and CTO of the  
National Spectrum Consortium  
apurva.mody@airanaculus.com  
404-819-0314,  
Chelmsford, MA, USA

## EDUCATION

---

### Georgia Tech

#### Ph.D. Electrical Engineering 2004

- Research focused on Receiver Implementation for MIMO-OFDM Systems
- Published numerous conference papers and journal papers
- Published five patent applications that apply to 4G technologies. Patents sold to investors

### Massachusetts Institute of Technology

- Course on Optimization

### University of Texas at El Paso

#### M. S. in Electrical Engineering 1998

- Research focused on Mathematical Modeling and Performance Evaluation of High Capacity M-QAM Fiber Optic Links
- Published one paper in IEE Electronic Journal and three conference papers

## HONORS

---

- IEEE Standards Association Medal for creating cognitive radio and spectrum sharing technologies to alleviate the digital divide.
- Chairman and Chief Technology Officer of the National Spectrum Consortium - \$1B organization set up by the US Government to solve the toughest problems that nation faces on spectrum
- Trusted relationship with high ranking Senior Executive personnel from many organizations such as FCC, NTIA, DoD CIO, DoD R&E, ITU.
- Founding Chairman of the WhiteSpace Alliance – Using Software Defined Radio technologies to provide low-cost broadband connectivity.

- Member of the Executive Committee – IEEE 802, National Spectrum Consortium and WhiteSpace Alliance
- Commendation from Lieutenant Colonel Tom Schwab for outstanding work to eliminate sources of electronic interference that were severely disrupting the training for the war-fighters about to leave for Iraq and Afghanistan.
- Many Business Leader Awards from BAE Systems for creation of breakthrough technologies. Recognized as a Thought Leader.
- Published more than 50 conference papers, 20 patents and 4 Book Chapters
- Senior Member IEEE, Member Eta Kappa Nu and Tau Beta Pi Honor Societies
- Outstanding Leadership Award for Excellence in Service to the International Community, UT El Paso.

## AREAS OF EXPERTISE

---

5G and Beyond, Non-traditional means of Communications, Spectrum Dominance Awareness and Sharing, Spectrum Exploitation, White and Gray Space Utilization, Spectrum Sensing, Signal Detection and Characterization, Cognitive Communications, Cognitive and Software Defined Radio, Cognitive Radar, Electronic Warfare (EW), Intelligence Surveillance and Reconnaissance (ISR), Blockchain, Data Analytics and Data Mining, Artificial Intelligence (AI) and Machine Learning, Organizational and Technical Leadership, Program Management, Capture Team Lead, Principal Investigator, Business Development, Standards Development (IEEE, IETF, 3gpp), Strategic Thinking, Government Interactions and Regulations, Rural Broadband, Wireless & Fiber Optic Communications, Non Govt. Organizations, Strategic Advisor to Governments.

**PROGRAMMING AND SOFTWARE:** MATLAB, C, Python, Microsoft Office, Microsoft Project, SharePoint, Salesforce.

**SKILL SET:** Problem Solving, Project Management, Algorithm Design, Modeling and Simulation, Signal Processing, Data Analytics, Data Mining, Machine Learning, Neural Networks, AI, Autonomy, Optimization, Blockchain.

## WORK EXPERIENCE

---

### AiRANACULUS – Founder

Chelmsford, MA, August 2019 to Present

- Technology Consulting Company for Research, Development, Prototyping and Intellectual Property Generation.
- 5G and Beyond, Non-traditional means of Communications,
- Spectrum Dominance Awareness and Sharing
- EW and ISR,
- Smart Grid and Critical Infrastructure Communications,
- Industrial Internet of Things (IIoT),
- Comms, Radar, EW, ISR Spectrum Sharing.

- Explore new directions in the areas of Blockchain, Machine Learning, Smart Grid, AI and Quantum Computing.

## **BAE Systems – Technology Development Manager (GG14)**

Burlington, MA

Group Lead–Dominance Awareness and Sharing (DASH) Jul 2016 – Aug 2019

- Created the DASH Group consisting of highly skilled researchers to solve problems related to Spectrum Sharing.
- Annual R&D revenue stream of \$10M annually.
- Responsible for setting the Mission, Vision and Execution of the Group
- The group published 5 conference papers, one journal paper and applied for 5 patents.
- Recent patents – (1) Advanced Beaconing for Spectrum Sharing between Radar and Communications, (2) Techniques for Implementing Portable Spectrum Analyzer, (3) Distributed Spectrum Management Using Blockchain Technology
- Recent Papers – Wideband Cyclostationary Signal Processing Using Sparse Subsets of Narrow-band Subchannels, IEEE Journal on Cognitive Radios and Networks, 2018

## **BAE Systems – Senior Principal Scientist (Global Grade 11-13)**

Burlington, MA

June 2005 – June 2016

- Responsible for growing the BAE Systems expertise and market share on Cognitive Radio, Dynamic Spectrum Access, Spectrum Sharing and Spectrum Exploitation related research programs.
- Responsible for capturing and leading many strategic business programs at BAE Systems. These programs have resulted in development of potential solutions to Radar and Communications Spectrum Sharing, Development of Spectrum Sensing Chip, Novel Interference Mitigation Techniques, Co-existence between Communications and Electronic Warfare (EW) systems, as well as Implementation of Low-cost Techniques to make any Radio Cognitive using External Sensor and Application-level Messaging.
- Proposed techniques to create a solution to provide the Power Grid infrastructure an alternate Secure Emergency Network during Wide-Scale and Pervasive Cyber-Attacks.

## **National Spectrum Consortium (NSC) – Ex-Com Member Served as Vice Chair and Chair**

Washington, D. C., Sommerville, SC

December 2015 – August 2019

Formerly Vice Chair, Chair and CTO

- Responsibilities included visibility and growth of the NSC, interactions with the White House

OSTP, United States Congress and Senate, Office of Management and Budget, NTIA, FCC, interactions with various Department of Defense and Government agencies to bring in new funding sources to the NSC, participate in the meetings of the Executive Committee to set the NSC strategy and focus.

- Technical Interchange Meetings with Senior Executive Personnel within the DoD to understand their problems and set new R&D directions for the NSC. Execute NSC Strategy on 5G and Trusted Microelectronics.
- Help Government open new federal spectrum bands for commercial use, while causing no mutual interference.

## **WhiteSpace Alliance (WSA) – Chairman**

Chelmsford, MA

December 2011 – Present – Founding Chairman

- Responsibilities include visibility and growth of the WSA, interactions with NTIA, FCC and other regulators all over the world, working with the ITU, creating new business models and relationships for the benefit of the WSA members, chair the executive committee meetings.
- Participate in ITU, United Nations Commission on Science and Technology for Development (UNCTAD) and IEEE sponsored events to educate regulators on TV Band WhiteSpaces and Spectrum Sharing to create technologies to alleviate the digital divide that exists today.

## **IEEE 802.22 Chairman**

Piscataway, NJ

December 2010 – Present – Chairman, IEEE 802.22 Working Group

- Responsibilities include completion of various IEEE 802.22 Projects on Cognitive Radio and Spectrum Sharing
- Work with IEEE to proliferate WhiteSpace Regulations across the world as a Technology to Benefit Humanity.

## **HOBBIES**

- As the Chairman of the WhiteSpace Alliance and IEEE 802.22, initiated projects across the globe for broadband deployments in rural areas and developing countries.
- Engaged with regulators, ministers and secretaries from many countries for proliferation of TV WhiteSpace
- Playing Indian Classical Music on Sarod.
- Coaching the First Lego League Team – Received Li'll Einstein's Award for Innovation