IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

FOUR BATONS WIRELESS, LLC *Plaintiff*, v. SAMSUNG ELECTRONICS CO., LTD. and SAMSUNG ELECTRONICS AMERICA, INC., *Defendants*.	Case No. 2:24-cv-00284-JRG

PLAINTIFF FOUR BATONS WIRELESS, LLC'S
INITIAL PROPOSED CONSTRUCTIONS

Under this Court's Scheduling Order and Local Rule 4-2, Plaintiff Four Batons Wireless, LLC ("Four Batons") hereby provides its Preliminary Claim Constructions and Extrinsic Evidence for the asserted claims of U.S. Patent Nos. 8,798,006 (the "'006 Patent"), 8,239,671 (the "'671 Patent"), 7,502,348 (the "'348 Patent"), and 8,073,436 (the "'436 Patent") (collectively, the "Asserted Patents").

Four Batons reserves the right to supplement this disclosure, including the right to add to or remove from or otherwise modify or amend their proposed claim constructions and extrinsic evidence to the extent allowed by applicable law, rule, order, or other practice or agreement. Four Batons may further supplement this disclosure in light of the positions that Defendants take in this litigation.

I. Preliminary Proposed Claim Constructions and Extrinsic Evidence

Subject to the above, Four Batons attaches its preliminary proposed claim constructions and preliminary identification of extrinsic evidence for the Asserted Patents as Exhibit A. Four

Batons' preliminary proposed claim constructions apply to each element of the asserted claim(s) where the term appears, unless otherwise indicated. Four Batons further reserves the right to rely on extrinsic evidence cited by Defendants, additional extrinsic evidence to rebut as needed, any construction offered by Defendants, and any extrinsic evidence developed as discovery proceeds.[1]

II. Expert Testimony

Four Batons intends to rely on expert testimony in support of its constructions, including expert testimony regarding the technology that underlies the alleged inventions, the level of ordinary skill in the art, how the Asserted Patents, claims, and intrinsic or extrinsic evidence would be understood by one of ordinary skill in the art, the alleged inventions claimed in the Asserted Patents, the meaning of the disputed claim terms, phrases, and clauses to one of ordinary skill in the art, and any other opinions or testimony useful to the Court in conducting the requisite claim constructions. Four Batons may also offer expert testimony for any tutorial the Court may wish to conduct. Four Batons may also offer expert testimony to rebut any extrinsic evidence offered by Defendants, including any expert opinions. Four Batons preliminarily identifies Dr. Martin J. Feuerstein as said expert. The CV for Dr. Feuerstein is attached herein as Exhibit B.

Dated: May 5, 2025

Respectfully submitted,

/s/ Meng Xi

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Joseph S. Grinstein

[1] Four Batons reserves the right to adopt or object to the construction of terms and phrases proposed by Defendants. Four Batons further reserves all rights to supplement and amend its list of proposed terms and claim elements for construction, its constructions, and supporting evidence. Four Batons also reserves all rights to offer additional or alternative constructions and supporting evidence in light of any assertion by Defendants that any term or phrase in the Asserted Patents is invalid under 35 U.S.C. § 112.

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CERTIFICATE OF SERVICE

I hereby certify that on May 5, 2025, I served the above and foregoing instrument on all counsel of record via email.

Allen J. Hernandez

EXHIBIT A

Preliminary Proposed Constructions and Extrinsic Evidence under Local Patent Rule 4-2

I. U.S. Patent No. 8,798,006 (the "'006 Patent")

Claim Term	'006 Patent Claim(s)	Proposed Construction and Extrinsic Evidence
"two sample tests"	1, 3	Plain and Ordinary Meaning
"two-sample method"	2	Plain and Ordinary Meaning
"location of samples"	7	Plain and Ordinary Meaning
"the mobile device having limited knowledge of the quality of the current path"	4	Plain and Ordinary Meaning
"having insufficiently many measurements for an estimate of the mean quality of the current path and its variance"	5	Plain and Ordinary Meaning
"observations are not matched"	5	Plain and Ordinary Meaning

II. U.S. Patent No. 8,239,671 (the "'671 Patent")

Claim Term	'671 Patent Claim(s)	Proposed Construction and Extrinsic Evidence
"channel binding key"	1, 6, 10, 11, 18, 19	Plain and Ordinary Meaning
"channel binding master key"	1, 6, 8, 11, 18	Plain and Ordinary Meaning
"key binding blob"	1, 6, 7, 11, 18	Plain and Ordinary Meaning
"server"	10	Plain and Ordinary Meaning IEEE Standard Dictionary of Electrical and Electronics Terms, Sixth Edition, IEEE Std. 100-1996, 10 December 1996, ISBN 1-55937-833-6, pp. 972–73 (4B-SAM_00002040–2044).
"authenticator"	1, 3, 4, 7, 10, 11, 19	Plain and Ordinary Meaning
"supplicant" / "mobile supplicant"	1, 3, 8, 10	Plain and Ordinary Meaning
"authenticator-supplicant protocol"	7, 8, 10	Plain and Ordinary Meaning
"[deriving a / derive said] channel binding key from a channel binding master key bound to a key binding blob using a key derivation function"	1, 6	Plain and Ordinary Meaning
"said parameters"	3, 4	Plain and Ordinary Meaning
"EAP methods"	2	Plain and Ordinary Meaning
"said supplicant using the channel binding master key for protecting an authenticator-supplicant protocol"	8	Plain and Ordinary Meaning

III. U.S. Patent No. 7,502,348 (the "'348 Patent")

Claim Term	'348 Patent Claim(s)	Proposed Construction and Extrinsic Evidence
"while … the current network satisfies the mobile device's requirements"	1	Plain and Ordinary Meaning
"silent period of an application"	1	Plain and Ordinary Meaning Reducing Energy Consumption on Mobile Devices with WiFi Interfaces, Tao Zhang, Sunil Madhani, Provin Gurung, Eric van den Berg, Telcordia Technologies, IEEE Communications Society, GLOBECOM '05 IEEE Global Telecommunications Conference proceedings, 2005, 28 November 2005 - 02 December 2005, St. Louis, MO, https://ieeexplore.ieee.org/document/1577687 (4B-SAM_00002045–2049).
"actionable silent period"	14, 15	Plain and Ordinary Meaning Reducing Energy Consumption on Mobile Devices with WiFi Interfaces, Tao Zhang, Sunil Madhani, Provin Gurung, Eric van den Berg, Telcordia Technologies, IEEE Communications Society, GLOBECOM '05 IEEE Global Telecommunications Conference proceedings, 2005, 28 November 2005 - 02 December 2005, St. Louis, MO, https://ieeexplore.ieee.org/document/1577687 (4B-SAM_00002045–2049).
"after having the mobile device start said at least one handoff action"	16, 17	Plain and Ordinary Meaning

IV. U.S. Patent No. 8,073,436 (the "'436 Patent")

Claim Term	'436 Patent Claim(s)	Proposed Construction and Extrinsic Evidence
"brief interval"	1, 17, 19	Plain and Ordinary Meaning
"a desired level"	11	Plain and Ordinary Meaning
"silent period"	15	Plain and Ordinary Meaning Reducing Energy Consumption on Mobile Devices with WiFi Interfaces, Tao Zhang, Sunil Madhani, Provin Gurung, Eric van den Berg, Telcordia Technologies, IEEE Communications Society, GLOBECOM '05 IEEE Global Telecommunications Conference proceedings, 2005, 28 November 2005 - 02 December 2005, St. Louis, MO, https://ieeexplore.ieee.org/document/1577687 (4B-SAM_00002045–2049).
"configured to"	19	Plain and Ordinary Meaning
"certain process" / "certain processes"	10, 15, 17	Plain and Ordinary Meaning

EXHIBIT B

Curriculum Vitae

Martin J. Feuerstein, Ph.D.

EDUCATION

Ph.D., E.E., Dissertation: Spread Spectrum Wireless Location and Communications, Virginia Tech, 1990
M.S., E.E., Thesis: Antennas and Electromagnetics, Northwestern University, 1987
B.E., E.E. and Mathematics, Magna Cum Laude, Vanderbilt University, 1984
Management and leadership short courses**:** MIT Sloan School of Management

PROFESSIONAL EXPERIENCE

JADE MARTIN CONSULTING LLC, PRINCIPAL **2003–present**

- Expert witness in multiple patent lawsuits for domestic and international clients on wireless technology and location services: 5G/4G/3G/2G, Wi-Fi, UWB, Bluetooth, SU-MIMO, MU-MIMO, massive MIMO, AAS, beamforming, antenna structures, spatial processing, HSPA, MUD, CDMA, OFDMA, QoS, DSP, FEC coding, eSIM/SIM, AuC, interference cancellation, network performance, message flows, capacity enhancement, antenna systems, network eNodeB and mobile device software/firmware
- Advisor to established and startup companies on technology, strategy, business development, marketing, product development, intellectual property acquisition and valuation, venture capital and private equity fund raising
- Focus on wireless technology, protocols and standards, location systems, smart antennas, Internet of Things, data analytics, safety and security systems
- Past engagement clients include: CommScope, T-Mobile, Verizon, Andrew, IBM, Nortel, Motorola, Philips, NextWave, TenXc Wireless, Intellectual Ventures, Lucent, IMS Legal Strategies, Rubin Anders, Cahn Litigation Services, Expert Research Group

OSSIA, CHIEF OPERATING OFFICER **2018–2024**

- Lead technology development and product strategy in wireless charging and IoT portfolio across industry segments using array antenna near field MIMO, 5G/4G, WiFi, Bluetooth, Zigbee, UWB radar, cellular
    - Managed product development engineering teams, including systems architecture, software, embedded firmware, cloud, hardware, technical program management, procurement, manufacturing and IT
    - Direct customer accounts through business plans, design wins, product development, production and market launch activities for Cota wireless power enabled products, such as IoT sensors
    - Personally courted and engaged Foxconn as an investor in Ossia and ecosystem partner for design and mass production of IoT devices, smartphones, wearables and power nodes
    - Guided technical teams at key customers, such as Walmart and Saint-Gobain, through program implementations (PoCs, reviews, implementation roadmaps, value propositions, business plans)
    - Set and execute product roadmaps, including ASICs, RDKs, hardware, systems, software, cloud and mobile apps, data analytics, regulatory (FCC/CE, UL) and manage partner engagements
    - Decisive thought leader in industry through blogs, webinars and presentations; wirelessly powered phone case won CES 2019 Innovation Award, power table product won CES 2022 Innovation Award

RECON DYNAMICS, CHIEF EXECUTIVE OFFICER & CTO **2011–2016**

- Headed company for lead investor Eagle River Investments (cellular telephone pioneer, Craig O. McCaw)
- Guided all aspects of the company's operations in wireless asset management capitalizing on M2M, IoT, cloud, analytics big data, mobile apps, asset location and tracking using 4G/3G cellular, WiFi, Bluetooth
- Raised over $12M in private equity venture capital and funded R&D to create new IoT product line from scratch
- Established Cooperative Research and Development Agreement (CRADA) with Battelle's Pacific Northwest National Laboratory (PNNL) to develop sensor fusion technologies for government security and force protection
- Under my leadership the company designed, integrated, manufactured and commercialized an award-winning asset management and safety product line which was successfully marketed into the energy industry
- Company was acquired by joint venture partner in July 2016

POLARIS WIRELESS, CHIEF TECHNOLOGY OFFICER **2003–2011**

- Led research and development of 4G/3G/2G AI Machine Learning position location products (SMLC, eSMLC, PDE) for E–911, security/surveillance, location–based services, presence and network optimization, including responsibility for hiring and managing high caliber R&D team through rapid growth phase
- Research and publications in advanced wireless location technologies using cellular, WiFi, GPS, A-GPS, Bluetooth and hybrid methods
- Improved accuracy, time to fix, transaction rates, urban and indoor performance and other aspects of fundamental location performance through major algorithm & product architecture advances
- Commercialized products for GSM, TDMA and UMTS to meet strict FCC accuracy limits. Created LTE system, as well as new products for network optimization and mass location for security/surveillance market. Prototyped & demonstrated for operators and government customers.
- Enabled successful commercial product sales driving company to reach profitability since 2004, grow revenue, expand customer base internationally and expand into new product lines (security, surveillance, optimization)

- Interacted personally with wireless carriers' technical organizations at AT&T, Verizon, Sprint, Docomo, Vodafone, Rogers, Telus and Bell Mobility including technical evaluations and RFP/RFI responses
- Established and guided joint R&D collaboration with leading Japanese wireless service provider in UMTS and LTE hybrid location methods to achieve best-in-class accuracy and time-to-fix resulting in joint IPR
- Drove technology partnerships, architectures and product interfaces with Alcatel Lucent, Motorola, Thales Alenia Space, Commprove, TCS, Actix, Andrew/CommScope, Verint and other joint bid partners
- Directed standardization initiatives in 3GPP RAN/SA/CT/GERAN, OMA LOC, ESIF, CSRIC and other industry organizations, including standardizing Polaris's RF Pattern Matching (RFPM) technology in 3GPP
- Managed intellectual property portfolio with ~50 pending patents. Key inventor and hands-on contributor.
- Authored FCC public comment filings for regulatory proceedings, managed relationships with regulatory agencies associated with E-911 and U.S. government agencies for surveillance/security applications
- Fostered and grew funded research collaboration projects with Stanford University, UC Berkeley, MIT, Georgia Tech and other leading university research labs to extend R&D capabilities

METAWAVE COMMUNICATIONS, CTO, SVP & GM **1997 - 2003**

- Invented and championed the company's flagship smart antenna adaptive array beamforming 2G/3G SpotLight CDMA product, convinced Board of Directors to back the proposal, developed and deployed the product under tight budget and schedule constraints, worked closely with customers driving sales to Verizon, Alltel, Iusacell. Built interfaces to multiple Lucent, Nortel, Motorola base stations. Evangelized within the wireless industry driving adoption of this new adaptive sectorization technology for traffic load balancing.
  - Product ramped to over 92% of revenue in 2 quarters after launch, enabling highly successful IPO.
  - Generated total sales revenues of over $100M over lifespan of product.
  - Implemented cost reductions and new features to improve gross margins from 26% to 34%.
- Grew the company from small startup stage into publicly traded industry leader. Heavily involved in venture capital funding rounds, roadshows, IPO process, SEC filings, relations with industry, press and financial community.
- Recommended acquisition of Adaptive Telecom Inc. (ATI) to accelerate next generation adaptive array technology and grow market share. Acquired ATI, proposed and implemented new business structure, and became General Manager for multi-site business unit with P&L responsibility. Worked closely with CEO and Board of Directors to set strategic direction. Led joint development with Samsung to embed adaptive array into base stations, concluded with $1M+ licensing and royalty agreement.
- Directed engineering (systems, hardware, software, systems, mechanical, test and certification), product management and research departments with 85 people and $12+M/yr budget. Built value propositions, business cases, roadmaps, rollout strategies and owned margins. Planned large, multifaceted development and deployment programs. Determined program content, milestones, schedules and inspired team to completion. Developed commercial products for cdmaOne/CDMA2000 and GSM/GPRS/EDGE.
- Conceived and patented designs for antenna sharing with independent sector pattern control. Conceptual idea later evolved into a new product line targeted at a diverse customer segment, tower owners.

LUCENT/AT&T BELL LABS, TECHNICAL MANAGER, CDMA OPTIMIZATION & APPLICATIONS **1995-1997**

- Led successful development rollout of Lucent's flagship 2G/2.5G CDMA product. Identified and fixed fatal flaws in call processing algorithms in the network equipment to make the product commercially viable. Convinced customers of product capabilities and value, enabling deployments resulting in $250M+ sales to Sprint, Primeco, GTE, AirTouch, Ameritech, Bell Atlantic, Centennial. As a result, Lucent captured and maintained a dominant 65% share of the cdmaOne/cdma2000 market.
- Resolved critical performance issues with key customers to launch networks and build revenues, several examples are:
  - Due to acceptance test failure at SprintPCS, performed comprehensive analyses and proposed power control algorithm improvements for reverse link capacity shortfall. Resolution led directly to completion of major contract milestone.
  - Commercial launch of Primeco network was halted due to radio performance failures. Proposed and conclusively proved solutions improving performance. Convinced Primeco's senior management to proceed with network rollout.
  - Major GTE markets experienced acute problems with call reliability. Spent months in these markets optimizing performance and building customer confidence. This achievement resulted in an important revenue payment.
- Implemented dramatic, market-proven improvements to handoff and power control algorithms. Headed task force created to resolve critical system requirements and performance problems.
- Guided radio performance optimization and network applications. Resolved technical bottlenecks, created deployment guidelines and tools, enabled CDMA to be rapidly deployed in widespread rollouts as a highly competitive technology.

VERIZON/USWEST/AIRTOUCH, SENIOR MEMBER TECHNICAL STAFF **1992-1995**

- Simulated performance of the world's first 2G CDMA cellular trials and deployments. Contributed to IS-95 standards through TIA/TR45.5 committee and CDMA Development Group. Wrote C/C++ software for performance prediction (power control, handover, interference management, overload control).
- Guided company's strategies on digital wireless technologies for rollout at cellular and PCS bands, such as smart antenna systems. Led joint industry test bed for comparative evaluation of air interfaces. Evaluated new network architectures, air interfaces, access methods.
- Key inventor of patented wireless position location system for position location, zone-based billing and E-911. Created robust statistical estimation algorithm to predict position in severe multipath. Simulated digital control loop for synchronization of base stations.

VIRGINIA TECH, ASS'T PROFESSOR, MOBILE/PORTABLE RADIO RESEARCH GROUP 1991-1992

- Principal Investigator on funded research projects in wireless location and communications. Supervised 3 M.S. student theses.
- Research in wireless Automated Position and Control (APAC) systems for Department of Energy funded project
- Created and published widely-referenced RF propagation models for microcellular design. Proposed frequency hopping band-sharing techniques to mitigate interference problems with European LEO satellite.
- Designed and built experimental spread spectrum systems for wideband channel sounding and high-resolution position estimation. Constructed hardware for both direct sequence and frequency hopping techniques.
- Taught wireless communications networks courses, developed curriculum, received teaching excellence rating.

NORTEL, SYSTEMS ENGINEER, ADVANCED COMMUNICATIONS TERMINALS 1984-1985

- Wrote node control LAN software for robotic automated test and repair facility
- Trialed knowledge-based AI expert system for computer aided repair of printed circuit boards, developed in academic collaboration with Vanderbilt University

PATENTS ISSUED

1. **9,959,458 Surveillance system**
2. **9,538,328 Estimating whether or not a wireless terminal is in a geographic zone using pattern classification**
3. **9,432,631 Surveillance system**
4. **9,398,402 Tracking large numbers of wireless terminals**
5. **9,247,516 Estimating whether or not a wireless terminal is in a geographic zone using pattern classification**
6. **8,583,141 Estimating the location of a wireless terminal based on signal path impairment**
7. **8,571,577 Estimating the location of a wireless terminal based on signal path impairment**
8. **8,565,786 Estimating the location of a wireless terminal based on signal path impairment**
9. **8,320,933 Estimating whether or not a wireless terminal is in a zone using radio navigation**
10. **8,155,394 Wireless location and facial/speaker recognition system**
11. **8,068,802 Estimating the location of a wireless terminal based on calibrated signal-strength measurements**
12. **7,899,467 Estimating the location of a wireless terminal based on the traits of the multipath components of a signal**
13. **7,796,966 Estimating the location of a wireless terminal based on calibrated signal-strength measurements**
14. **7,753,278 Estimating the location of a wireless terminal based on non-uniform locations**
15. **7,734,298 Estimating the location of a wireless terminal based on signal path impairment**
16. **6,950,416 Embedded digital beam forming**
17. **6,937,863 System and method for dynamically adjusting cell sectorization**
18. **6,829,491 Dynamic and self-optimizing smart network**
19. **6,522,897 RF radiation pattern synthesis using existing linear amplifiers**
20. **6,351,237 Polarization and angular diversity among antenna beams**
21. **6,246,674 Antenna deployment sector cell shaping system and method**
22. **6,181,276 Sector shaping transition system and method**
23. **6,178,333 System and method providing delays for CDMA nulling**
24. **6,141,565 Dynamic mobile parameter optimization**
25. **6,118,767 Interference control for CDMA networks using a plurality of narrow antenna beams and an estimation of the number of users/remote signals present**
26. **6,070,090 Input specific independent sector mapping**
27. **6,055,230 Embedded digital beam switching**
28. **6,005,516 Diversity among narrow antenna beams**
29. **5,758,288 Signal time of arrival position determining method for calculating cellular telephone billing charges**
30. **5,600,706 Method and system for determining the position of a mobile receiver**

PATENTS PENDING

1. **20130072230 Tracking Large Numbers of Wireless Terminals**
2. **20120289249 Estimating the Location of a Wireless Terminal Based on Signal Path Impairment**
3. **20120282947 Estimating the Location of a Wireless Terminal Based on Signal Path Impairment**
4. **20120249787 Surveillance System**

5. **20120014567 Wireless Location and Facial/Speaker Recognition System**
6. **20110298930 Integrated Wireless Location and Surveillance System**
7. **20100329144 Estimating the Location of a Wireless Terminal Based on Calibrated Signal-Strength Measurements**
8. **20100245115 Estimating the Location of a Wireless Terminal Based on Signal Path Impairment**
9. **20090280829 Using A Priori Geographical Location Density Information To Improve Location Accuracy**
10. **20080207222 Estimating Whether Or Not A Wireless Terminal Is In A Geographic Zone Using Pattern Classification**
11. **20080207219 Estimating Whether Or Not A Wireless Terminal Is In A Zone Using Radio Navigation**
12. **20060240846 Estimating the Location of a Wireless Terminal Based on Signal Path Impairment**
13. **20060240845 Estimating the Location of a Wireless Terminal Based on the Traits of the Multipath Components of a Signal**
14. **20060240843 Estimating the Location of a Wireless Terminal Based on Non-Uniform Locations**
15. **20060211376 Estimating the location of a wireless terminal based on calibrated signal-strength measurements**
16. **20170107090 Comprehensive Worksite and Transportation Safety System**

PUBLICATIONS

BOOKS AND BOOK CHAPTERS

- **High Speed Packet Access (HSPA) Performance and Evolution: A Practical Perspective**, John Wiley & Sons Ltd.
- **Wireless Personal Communications**, with Prof. T. Rappaport, Kluwer Academic Publishers
- **Wireless Network Deployments**, Chapter 3, Springer International
- **Wireless Communications: Emerging Technologies for Enhanced Communications,** Chapter 5, Springer International
- **Wireless Personal Communications: Channel Modeling and Systems Engineering,** *Chapter: Methods for Measuring and Optimizing Capacity in CDMA Networks Using Smart Antennas, Springer*
- **Wireless Personal Communications: Bluetooth and Other Technologies,** *Chapter: Smart Antennas for CDMA Cellular and PCS Networks, Springer*

TECHNICAL JOURNAL ARTICLES

- **Performance Evaluation of a Cellular Base Station Multibeam Antenna,** *IEEE Transactions on Vehicular Technology*
- **Path Loss, Delay Spread and Outage Models for Microcellular System Design**, *IEEE Transactions on Vehicular Technology*
- **Reflection Coefficients for Exterior Wall Surfaces in a Mobile Radio Environment**, *IEEE Transactions on Antennas & Propagation*
- **Distribution of Phase Errors in Wireless Position Location Systems,** *IEE Electronics Letters*
- **Performance of Decision Feedback Equalizers in Simulated Urban and Indoor Radio Channels***, IEICE Transactions on Communications*

TECHNICAL CONFERENCE PRESENTATIONS AND ARTICLES

- **Gain Improvement of a Cellular Base Station Multibeam Antenna,** IEEE Vehicular Technology Conference
- **The Future of Smart Antennas: Evolution to 3G and IP Networks**, IEEE Personal Indoor Mobile Radio Communications
- **Applications of Smart Antennas in Cellular Networks, *IEEE Antennas & Propagation Symposium***
- **Design and Test of CDMA Cellular Systems,** IEEE Vehicular Technology Conference
- **Performance of Decision Feedback Equalizers in Urban and Indoor,** IEEE Vehicular Technology Conference
- **Field Tests of Hybrid Wireless Location Technologies,** International Symposium on Advanced Radio Technologies
- **Design & Performance of Minimum Variance Hybrid Location Algorithms,** Institute of Navigation
- **Precision Automatic Vehicle Location System Construction Automation,** Vehicle Navigation and Information Systems Conference
- **In Situ Microwave Reflection Coefficient Measurements for Smooth and Rough Exterior Wall Surfaces,** IEEE Vehicular Technology Conference
- **Impact of Surrounding Buildings on Propagation for Wireless In-building Wireless System Design,** IEEE Vehicular Technology Conference
- **Path Loss and Delay Spread Models as Functions of Antenna Height for Microcellular System Design,** IEEE Vehicular Technology Conference
- **Applications of Smart Antennas to CDMA Cellular Mobile Radio Networks,** International Symposium on Advanced Radio Technologies
- **Applications of Smart Antennas in Cellular Networks,** IEEE Antennas and Propagation Society International Symposium
- **Future of Smart Antennas: Evolution to 3G and IP Networks,** IEEE International Symposium on Personal Indoor and Mobile Radio Communications

- **Wireless Signatures Technology for Position Location,** International Symposium on Advanced Radio Technologies
- **Multi-beam Smart Antenna System Performance in CDMA Networks,** CDMA Technology Conference
- **Melding Air Interfaces, Frequency Bands, User/Control Planes and Technologies,** Invitational Workshop on Opportunistic RF Localization for Next Generation Wireless Devices
- **Urban and Indoor Location using Pattern Matching of Wireless Network Measurements,** Invitational Workshop on Opportunistic RF Localization for Next Generation Wireless Devices, Future Directions, Technologies, Standards and Applications
- **Experimental Tests of Coverage and Handoff for a Low-power TDMA Wireless Access System,** IEEE International Conference on Universal Personal Communications
- **Effects of Hysteresis Level and Switching Time on the Performance of a Cellular Base Station Multibeam Antenna,** International Conference on Communications
- **Evolution of Smart Antennas to 3G,** CDMA Technology Conference
- **Role of Smart Antennas in 3G Network Optimization,** CDMA Americas Congress
- **Alternatives for Maximizing Capacity and Quality in CDMA Networks,** CDMA Americas Congress
- **SMART ANTENNAS: Technology to Enhance CDMA2000 Networks, CDMA Americas Congress**
- **Methods for Measuring and Optimizing Capacity in CDMA Networks using Smart Antennas,** Advanced CDMA Workshop
- **Unlocking Wireless Capacity,** 3G Forum
- **Smart Antennas for 2nd and 3rd Generation CDMA Networks,** IEEE International Conference on Third Generation Wireless and Beyond
- **Practical Applications of Smart Antennas,** IEC National Wireless Engineering Conference
- **Measurements and Models of Capacity Increases for Smart Antennas in CDMA Cellular Networks,** RAWCON (RF and Wireless Conference) SA Workshop
- **Smart Antennas for CDMA Cellular Systems,** Stanford Workshop on Smart Antennas in Wireless Communications
- **Evolution of Smart Antennas from 2G to 3G Air Interfaces: Capacity Increases and Performance Optimization,** Stanford Smart Antenna Workshop
- **Architecture and Performance Analysis of a Novel Smart Antenna for CDMA Cellular Networks,** IEEE Wireless Communications and Networking Conference (WCNC)
- **The Role of Smart Antennas in Improving 3G Network Capacity and Performance,** Wireless Internet and 3G 2000
- **Architecture of a Smart Antenna for CDMA Cellular Networks, Wireless/Portable Engineering Technology** Conference PCIA GlobalXChange
- **SHORT COURSE TITLE: Smart Antennas for Analog and Digital Cellular Networks,** NORTHCON
- **Evolution of Smart Antennas from 2G to 3G CDMA,** MTT International Microwave Symposium Smart Antenna Workshop
- **Smart Antennas Increase Capacity and Quality of CDMA Networks,** CDMA Development Group (CDG) Digivent
- **THE EVOLUTION OF SMART ANTENNAS TO 3G,** CDMA Development Group (CDG) Technology Forum
- **Exploiting Smart Antennas to Increase Capacity**, China CDMA International Summit

MAGAZINE ARTICLES AND OTHER PUBLICATIONS

- **Smart Antennas Increase Capacity in CDMA Networks,** *Wireless Design Online*
- **Smart Antennas: The Freedom to Choose,** *Wireless Design Magazine*
- **Unraveling the Complex World of E911 Wireless Location,** *Mobile Radio Technology*
- **E911 Location and Call Processing,** *National Emergency Number Association Magazine*
- **Locating Wireless Calls with Enhanced 9-1-1: How Does It All Work?,** *APCO Magazine*
- **Controlling RF Coverage–Smart Antennas Know How to Optimize CDMA Networks**, *America's Network*
- **Capacity Technology Previously Used for Military Applications: Smart Antennas Now Can Increase Capacity in CDMA Networks**, *Wireless Review*
- **Characterization of Electromagnetic Properties of Building Materials for Use in Site-specific Propagation Prediction**, *Virginia Tech Mobile and Portable Radio Research Group publications*
- **Multiple other magazine articles in trade press**

QUOTED AS WIRELESS TECHNOLOGY SUBJECT MATTER EXPERT

- **GPS World (multiple articles)**
- **RCR Wireless (multiple articles)**
- **Wireless Week (multiple articles)**
- **GPS World (multiple articles)**
- **Electrical Engineering Times**
- **Reuters**
- **Government Technology**
- **Internet Telephony**
- **The Where Business (multiple articles)**
- **Converge Network Digest (multiple articles)**
- **Computer World**
- **GIS User**
- **Beta News**