MATTHEW C. VALENTI

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I. PROFESSIONAL BACKGROUND

A. EDUCATION

Virginia Tech
Ph.D., Electrical Engineering, August 1999
B.S., Electrical Engineering, May 1992

Johns Hopkins University
M.S., Electrical Engineering, May 1995

B. EMPLOYMENT AND APPOINTMENTS

West Virginia University, *Lane Department of Computer Science and Electrical Engineering*
Professor, 2010 to present
Raymond J. Lane Department Chair, July 1, 2020 to June 30, 2021
Interim Chair, July 1, 2019 to June 30, 2020
Associate Professor, 2005 to 2010
Assistant Professor, August 1999 to 2005

Center for Identification Technology Research (CITeR), *an NSF I/UCRC*
Director, WVU Site, Aug. 2014 to present.

Virginia Tech, *Bradley Department of Electrical and Computer Engineering*
Bradley Fellow, Graduate Research Assistant, and Instructor, Aug. 1995-July 1999

U.S. Naval Research Laboratory, *Naval Center for Space Technology*
Electronics Engineer, Summer 1991, May 1992-August 1995

C. HONORS AND AWARDS

IEEE MILCOM Award for Sustained Technical Achievement (2019)

Fellow, Institute of Electrical and Electronics Engineers (IEEE)
Student Member 1992, Member 1999, Senior Member 2007, Fellow 2018

WVU Foundation Outstanding Teaching Award (2013)

Outstanding Teacher (2012, 2009, 2006, 2003, and 2001)
Outstanding Advisor (2012, 2004)
Outstanding Researcher (2008, 2001, and 2000)
West Virginia University, Statler College of Engineering and Mineral Resources

Bradley Fellow, August 1995-May 1998
Virginia Tech, Bradley Department of Electrical Engineering

D. PROFESSIONAL REGISTRATION

Professional Engineer (P.E.)
Registered in the state of West Virginia since 2011

II. TECHNICAL CONSULTING BACKGROUND

A. PATENT LITIGATION SUPPORT AND EXPERT WITNESS EXPERIENCE

1. Fish & Richardson for Dell Inc., and Dell Technologies, Inc.
   Dates: 2021
   Venue: United States Patent and Trademark Office
   Cases: Petition for *Inter Partes* Review (IPR) of US Patent No. 8,467,366 (held by Neo Wireless LLC)
   Technology: Wireless technology including OFDM transmissions and ranging signals
   Activity: Expert Declaration (in support of IPR Petition).

2. Kirkland & Ellis for Samsung
   Dates: 2021
   Venue: United States Patent and Trademark Office
   Cases: Petition for *Inter Partes* Review (IPR) of US Patent No. 8,023,990, US Patent No. 8,798,658, US Patent No. 9,277,436, and US Patent No. 10,476,722 (all held by Ericsson)
   Technology: Wireless technology including LTE-A minimization of drive testing (MDT) and 5G NR synchronization
   Activity: Expert Declarations (in support of IPR Petitions)

3. Kirkland & Ellis for Lenovo
   Dates: 2020-2021
   Venue: UK High Court
   Cases: InterDigital Technology Corporation and others v Lenovo Group Limited and others (Claim No. HP-2019 000032)
   Technology: Wireless technology including control signaling for LTE
   Activity: Expert Report (invalidity, non-essentiality), Two Rebuttal Reports, Court Testimony (UK bench trial): Mar. 5-9, 2021.

4. Fish & Richardson for LG
   Dates: 2019
   Venue: United States Patent and Trademark Office
   Cases: Petition for *Inter Partes* Review (IPR) of US Patent No. 7,039,435 (held by Bell Northern Research)
   Technology: Wireless technology including power control of wireless transmissions
   Activity: Expert Declaration (in support of IPR Petition).

5. Quinn Emanuel Urquhart & Sullivan for Samsung
   Dates: 2017-2019
   Venue: United States District Court; Northern District of California (San Francisco Division)
   Cases: Samsung Electronics Co., LTD, et al. (counterclaim-plaintiffs) v. Huawei Technologies Co., LTD., et al. (counterclaim-defendants), Case No. 16-cv-02787-WHO
   Huawei Technologies Co., LTD vs. Samsung Electronics Co., LTD, Case IPR2017-01974 (US Patent 8,457,588)
   Huawei Technologies Co., LTD vs. Samsung Electronics Co., LTD, Case IPR2017-01982 (US Patent 8,228,827)
   Technology: LTE wireless technology.
   Activity: Declarations (Claim Construction, 2 Patent Owner's Responses to Petition for IPR); Expert Report (Infringement); Rebuttal Report (Validity). Depositions (June 20, 2018, Aug. 10, 2018, Aug. 11, 2018).

6. Fish & Richardson for Apple
   Dates: 2017-2019
   Venue: United States District Court; Southern District of California
   Cases: Apple Inc. v. Qualcomm Inc., Civil Action No. 3:17-cv-00108
   Technology: LTE wireless technology.
   Activity: Expert Report (Patent portfolio technical evaluation). Deposition (Oct. 17, 2018). *Testimony before jury was scheduled for April 22, 2019, but case settled after opening arguments.*

7. Baker Botts for AT&T; Gibson, Dunn & Crutcher for T-Mobile
   Dates: 2016-2017
   Venue: United States District Court; District of Delaware
   Cases: (a) Intellectual Ventures I LLC v. AT&T Mobility LLC et al., Civil Action No. 12-CV-193-LPS (D. Del.); Intellectual Ventures I LLC v. AT&T Mobility LLC et al., Civil Action No. 1:15-CV-00799-LPS.
   (b) Intellectual Ventures I LLC v. T-Mobile USA Inc. et al. D. Del. Case No. 1:13-cv-1632-LPS.
   Technology: HSDPA wireless technology.
   Activity: Expert Report; Declaration; Sur-Reply Report. Deposition (Mar. 23, 2017).

8. Rothwell Figg for LG; Paul Hastings for Samsung; Mayer Brown for Motorola Mobility
   Dates: 2016
   Venue: United States District Court; Southern District of California
   Cases: (a) Odyssey Wireless Inc. v. LG Electronics USA, Inc. et al., Civil Action No. 3:15-cv-01746-H-RBB (S.D. Cal.).
   (b) Odyssey Wireless Inc. v. Samsung Electronics Co. et al., Civil Action No. 3:15-cv-01738-H-RBB (S.D. Cal.).
   (c) Odyssey Wireless Inc. v. Motorola Mobility, Civil Action No. 3:15-cv-01741-H-RBB (S.D. Cal.).
   Technology: LTE wireless technology.
   Activity: Expert Report (noninfringement). Deposition (Aug. 24, 2016).

9. Sheppard Mullin for Samsung; Gibson Dunn and Wilmer Hale for Intel; Boies Schiller for Apple
   Dates: 2016
   Case: Various regulatory agencies' investigations of Qualcomm Incorporated ("Qualcomm"), including the Korean Fair Trade Commission (the "KFTC") and the United States Federal Trade Commission (the "FTC").
   Technology: LTE wireless technology.
   Activity: Declaration (technical analysis of patent portfolio).

10. Boies, Schiller & Flexner for Apple; Sheppard, Mullin, Richter & Hampton for HTC; Kilpatrick Townsend & Stockton for Lenovo and Motorola Mobility; Quinn Emanuel Urquhart & Sullivan for Samsung; McDermott Will & Emery for ZTE; SidleyAustin for Microsoft
    Dates: 2016
    Venue: United States District Court; District of Delaware
    Cases: (a) Evolved Wireless, LCC, v. Apple Inc., Civil Action No. 1:15-cv-00542-SLR.
    (b) Evolved Wireless, LCC, v. HTC Corporation and HTC America, Inc., Civil Action No. 1:15-cv-00543-SLR. (c) Evolved Wireless, LCC, v. Lenovo Group Ltd., Lenovo (United States) Inc., and Motorola Mobility, Civil Action No. 1:15-cv-00544-SLR.
    (d) Evolved Wireless, LCC v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc., Civil Action No. 1:15-cv-00545-SLR. (e) Evolved Wireless, LCC v. ZTE Corporation, ZTE (USA) Inc., and ZTE Solutions Inc., Civil Action No. 1:15-cv-00546-SLR. (f) Evolved Wireless, LCC v. Microsoft Corporation, Microsoft Mobile OY and Nokia Inc., Civil Action No. 1:15-cv-00547-SLR.
    Technology: LTE wireless technology.
    Activity: Declaration (claim construction).

11. Williams & Connolly
    Dates: 2015
    Case: Confidential Parties (Leading Global Wireless Communication Companies)
    Consolidated Arbitrations Under the International Chamber of Commerce Rules.
    Technology: LTE wireless technology.
    Activity: Expert Report (patent portfolio technical evaluation).

12. Kirkland & Ellis for Samsung
    Dates: 2013
    Case: Samsung Electronics and Samsung Telecommunications America v. Ericsson Inc.
    In the Matter of Certain Wireless Communications Equipment and Articles Therein
    US. International Trade Commission (ITC) Investigation No. 337-TA-866
    Technology: LTE wireless technology.
    Activity: Expert Report (infringement, domestic industry practice), rebuttal report (validity).
    Court testimony (ITC bench trial): direct (Oct. 23, 2013) and rebuttal (Oct. 30, 2013).

13. Quinn Emanuel Urquhart & Sullivan, LLP for Samsung
    Dates: 2013
    Case: Samsung Electronics GmbH v. Apple Inc.
    German Patent Court, Case Number 5 Ni 49/11
    Technology: Turbo codes; LTE wireless technology.
    Activity: Declaration (validity).

14. Kirkland & Ellis for DIRECTV
    Dates: 2009
    Case: Rembrandt Data Technologies v. DIRECTV, Inc. et al.
    Eastern District of Virginia, Case No. 1:08cv1009
    Technology: Telephone modems; set-top boxes.
    Activity: Rebuttal Expert Report (non-infringement). Deposition (May 20, 2009).

15. Kirkland & Ellis for Samsung
    Dates: 2006
    Case: Samsung Electronics and Samsung Telecommunications America v. Ericsson Inc.
    In the Matter of Certain Wireless Communications Equipment, Articles Therein, and Products Containing the Same
    ITC Investigation No. 377-TA-577
    Technology: WCDMA/UMTS wireless technology; mobile phone handsets.
    Activity: Declaration (domestic industry practice). Deposition (Nov. 17, 2006).

B. TECHNICAL CONSULTING OF A NON-LEGAL NATURE OVER PAST TEN YEARS

1. 4D Tech Solutions, Morgantown, WV
   Nonorthogonal Frequency Division Multiplexing
   July 2017 to Dec 2018.

C. DESCRIPTION TECHNICAL AREA OF EXPERTISE

Dr. Valenti's area of expertise is communication technology, with an emphasis on wireless and cellular networks. This includes physical-layer technology; i.e., modulation, error-control coding, and receiver design, as well as issues related to cellular network call processing (e.g., control signal formats and protocols). Dr. Valenti has a working knowledge of several current standards, including UMTS/WCDMA (3-G Cellular), LTE (4-G Cellular), 5G NR, WiMAX, and DVB-S2 (Satellite Television).

III. RESEARCH

A. PUBLICATIONS

Journal Papers

J1. T. Ketseoglou, **M.C. Valenti**, and E. Ayanoglu "Millimeter wave massive MIMO downlink per-group communications with hybrid linear precoding," *IEEE Transactions on Vehicular Technology*, vol. 70, no. 7, pp. 6841-6854, July 2021.

J2. V. Talreja, **M.C. Valenti,** and N. M. Nasrabadi, "Deep hashing for secure multimodal biometrics," *IEEE Transactions on Information Forensics and Security*, vol. 16, pp. 1306-1321, 2021.

J3. F. Taherkhani, V. Talreja, **M.C. Valenti**, and N.M. Nasrabadi "Error-corrected margin-based deep cross-modal hashing for facial image retrieval," *IEEE Transactions on Biometrics, Behavior, and Identity Science*, vol. 2, no. 3, pp. 279-293, July 2020.

J4. E. Hriba and **M.C. Valenti**, "Correlated blocking in mmwave cellular networks: Macrodiversity, outage, and interference," *Electronics (Special Issue on Millimeter-Wave (mmWave) Communications)*, vol. 8, no. 10, article number 1187, Oct. 2019.

J5. T. Ferrett and **M.C. Valenti**, "Noncoherent LDPC-coded physical-layer network coding using multitone FSK," *IEEE Transactions on Communications*, vol. 66, no. 6, pp. 2384-2395, June 2018.

J6. D. Torrieri, S. Talarico, and **M.C. Valenti**, "Analysis of a frequency-hopping millimeter-wave cellular uplink," *IEEE Transactions on Wireless Communications*, vol. 15, no. 10, pp. 7089-7098, Oct. 2016.

J7. K. Venugopal, **M.C. Valenti**, and R. W. Heath, Jr., "Device-to-device millimeter wave communications: Interference, coverage, rate, and finite topologies," *IEEE Transactions on Wireless Communications*, vol. 15, no. 9, pp. 6175-6188, Sept. 2016.

J8. D. Torrieri, S. Talarico, and **M.C. Valenti**, "Performance comparisons of geographic routing protocols in mobile ad hoc networks," *IEEE Transactions on Communications*, vol. 63, no. 11, pp. 4276-4286, Nov. 2015.

J9. P. Rost, S. Talarico, and **M.C. Valenti**, "The complexity-rate tradeoff of centralized radio access networks," *IEEE Transactions on Wireless Communications*, vol. 14, no. 11, pp. 6164-6176, Nov. 2015.

J10. **M.C. Valenti**, D. Torrieri, and S. Talarico, "A direct approach to computing spatially averaged outage probability," *IEEE Communications Letters*, vol. 18, no. 7, pp. 1103-1106, July 2014.

J11. S. Talarico, N.A. Schmid, M. Alkhweldi, and **M.C. Valenti**, "Distributed estimation of a parametric field: Algorithms and performance analysis," *IEEE Transactions on Signal Processing*, vol. 62, no. 5, pp. 1041-1053, Mar 1, 2014.

J12. D. Torrieri, **M.C. Valenti**, and S. Talarico, "An analysis of the DS-CDMA cellular uplink for arbitrary and constrained topologies," *IEEE Transactions on Communications*, vol. 61, no. 8, pp. 3318-3326, Aug. 2013.

J13. D. Torrieri and **M.C. Valenti**, "Exclusion and guard zones in DS-CDMA ad hoc networks," *IEEE Transactions on Communications*, vol. 61, no. 6, pp. 2468-2476, June 2013.

J14. D. Torrieri and **M.C. Valenti**, "The outage probability of a finite ad hoc network in Nakagami fading," *IEEE Transactions on Communications*, vol. 60, pp. 3509-3518, Nov. 2012.

J15. **M.C. Valenti** and X. Xiang, "Constellation shaping for bit-interleaved LDPC coded APSK," *IEEE Transactions on Communications*, vol. 60, pp. 2960-2970, Oct. 2012.

J16. **M.C. Valenti**, D. Torrieri, and T. Ferrett, "Noncoherent physical-layer network coding with FSK modulation: Relay receiver design issues," *IEEE Transactions on Communications*, vol. 59, no. 9, pp. 2595-2604, Sept. 2011.

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