Moe Z. Win

Professor, Aeronautics and Astronautics

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Ph.D. in Electrical Engineering, University of Southern California, 1998.
M.S. in Applied Mathematics, University of Southern California, 1998.
B.S. in Electrical Engineering, Texas A&M University, 1987.

BRIEF BIOGRAPHY

Moe Win is a Professor at the Massachusetts Institute of Technology (MIT) and the founding director of the Wireless Communication and Network Sciences Laboratory. Prior to joining MIT, he was with AT&T Research Laboratories for five years and with the Jet Propulsion Laboratory for seven years. His research encompasses fundamental theories, algorithm design, and experimentation for a broad range of real-world problems. His current research topics include network localization and navigation, network interference exploitation, intrinsic wireless secrecy, adaptive diversity techniques, ultra-wide bandwidth systems, optical transmission systems, and space communication systems.

Professor Win was honored with two IEEE Technical Field Awards: the IEEE Kiyo Tomiyasu Award and the IEEE Eric E. Sumner Award. He received the Copernicus Fellowship, the Royal Academy of Engineering Distinguished Visiting Fellowship, the Fulbright Fellowship, the IEEE Communications Society Edwin H. Armstrong Achievement Award, the International Prize for Communications Cristoforo Colombo, the *Laurea Honoris Causa* from the University of Ferrara, the Technical Recognition Award of the IEEE ComSoc Radio Communications Committee, and

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the U.S. Presidential Early Career Award for Scientists and Engineers. He is elected Fellow of the AAAS, the IEEE, and the IET, and served as an IEEE Distinguished Lecturer.

Professor Win was an elected Member-at-Large on the IEEE Communications Society Board of Governors (2011-2013). He was the Chair (2004-2006) and Secretary (2002-2004) for the Radio Communications Committee of the IEEE Communications Society. He is currently an Editor-at-Large for the IEEE Wireless Communications Letters. He served as Editor (2006–2012) for the IEEE Transactions on Wireless Communications, and served as Area Editor (2003-2006) and Editor (1998-2006) for the IEEE Transactions on Communications.

RESEARCH AREAS

- Network localization and navigation
- Network interference exploitation
- Intrinsic wireless secrecy
- Adaptive diversity techniques
- Ultra-wideband systems

SELECTED PUBLICATIONS

- S. Bartoletti, W. Dai, A. Conti, and M. Z. Win, "A mathematical model for wideband ranging," *IEEE J. Sel. Topics Signal Process.*, vol. 9, no. 2, pp. 216–228, Mar. 2015.
- A. Rabbachin, A. Conti, and M. Z. Win, "Wireless network intrinsic secrecy," *IEEE/ACM Trans. Netw.*, vol. 23, no. 1, pp. 56–69, Feb. 2015.
- A. Conti, M. Guerra, D. Dardari, N. Decarli, and M. Z. Win, "Network experimentation for cooperative localization," *IEEE J. Sel. Areas Commun.*, vol. 30, no. 2, pp. 467–475, Feb. 2012.
- M. Z. Win, A. Conti, S. Mazuelas, Y. Shen, W. M. Gifford, D. Dardari, and M. Chiani, "Network localization and navigation via cooperation," *IEEE Commun. Mag.*, vol. 49, no. 5, pp. 56–62, May 2011.
- Y. Shen and M. Z. Win, "Fundamental limits of wideband localization – Part I: A general framework," *IEEE Trans. Inf. Theory*, vol. 56, no. 10, pp. 4956–4980, Oct. 2010.
- M. Chiani, M. Z. Win, and H. Shin, "MIMO networks: The effects of interference," *IEEE Trans. Inf. Theory*, vol. 56, no. 1, pp. 336–349, Jan. 2010.
- A. Conti, W. M. Gifford, M. Z. Win, and M. Chiani, "Optimized simple bounds for diversity systems," *IEEE Trans. Commun.*, vol. 57, no. 9, pp. 2674–2685, Sep. 2009.
- M. Z. Win, P. C. Pinto, and L. A. Shepp, "A mathematical theory of network interference and its applications," *Proc. IEEE*, vol. 97, no. 2, pp. 205–230, Feb. 2009.
- D. Dardari, A. Conti, U. J. Ferner, A. Giorgetti, and M. Z. Win, "Ranging with ultrawide bandwidth signals in multipath environments," *Proc. IEEE*, vol. 97,

no. 2, pp. 404–426, Feb. 2009.
- W. P. Tay, J. N. Tsitsiklis, and M. Z. Win, "Data fusion trees for detection: Does architecture matter?" *IEEE Trans. Inf. Theory*, vol. 54, no. 9, pp. 4155–4168, Sep. 2008.
- W. Suwansantisuk and M. Z. Win, "Multipath aided rapid acquisition: Optimal search strategies," *IEEE Trans. Inform. Theory*, vol. 52, no. 1, pp. 174–193, Jan. 2007.
- A. Bletsas, H. Shin, and M. Z. Win, "Cooperative communications with outage-optimal opportunistic relaying," *IEEE Trans. Wireless Commun.*, vol. 6, no. 9, pp. 3450–3460, Sep. 2007.
- A. Conti, M. Z. Win, and M. Chiani, "Slow adaptive *M*-QAM with diversity in fast fading and shadowing," *IEEE Trans. Commun.*, vol. 55, no. 5, pp. 895–905, May 2007.
- M. Z. Win, N. C. Beaulieu, L. A. Shepp, B. F. Logan, and J. H. Winters, "On the SNR penalty of MPSK with hybrid selection/maximal ratio combining over IID Rayleigh fading channels," *IEEE Trans. Commun.*, vol. 51, no. 6, pp. 1012–1023, June 2003.
- M. Z. Win and J. H. Winters, "Virtual branch analysis of symbol error probability for hybrid selection/maximal ratio combining in Rayleigh fading," *IEEE Trans. Commun.*, vol. 49, no. 11, pp. 1926–1934, Nov. 2001.
- M. Chiani, M. Z. Win, and A. Zanella, "On the capacity of spatially correlated MIMO Rayleigh fading channels," *IEEE Trans. Inform. Theory*, vol. 49, no. 10, pp. 2363–2371, Oct. 2003.
- D. Cassioli, M. Z. Win, and A. F. Molisch, "The ultra-wide bandwidth indoor channel: From statistical model to simulations," *IEEE J. Select. Areas Commun.*, vol. 20, no. 6, pp. 1247–1257, Aug. 2002.
- M. Z. Win, G. Chrisikos, and N. R. Sollenberger, "Performance of Rake reception in dense multipath channels: Implications of spreading bandwidth and selection diversity order," *IEEE J. Select. Areas Commun.*, vol. 18, no. 8, pp. 1516–1525, Aug. 2000.
- M. Z. Win and R. A. Scholtz, "Ultra-wide bandwidth time-hopping spread-spectrum impulse radio for wireless multiple-access communications," *IEEE Trans. Commun.*, vol. 48, no. 4, pp. 679–691, Apr. 2000.
- S. W. Golomb and M. Z. Win, "Recent results on polyphase sequences," *IEEE Trans. Inform. Theory*, vol. 44, no. 2, pp. 817–824, Mar. 1998.
- M. Z. Win and R. A. Scholtz, "Impulse radio: How it works," *IEEE Commun. Lett.*, vol. 2, no. 2, pp. 36–38, Feb. 1998.

SELECTED AWARDS

- International Prize for Communications Cristoforo Colombo, 2013.
- IEEE Communications Society Stephen O. Rice Prize in the Field of Communications Theory, 2012.
- IEEE Communications Society William R. Bennett Prize in the Field of Communications Networking, 2012.

- IEEE Kiyo Tomiyasu Award for "fundamental contributions to high-speed reliable communications over optical and wireless channels," 2011.
- IEEE Aerospace and Electronic Systems Society M. Barry Carlton Award, 2011.
- IEEE Communications Society Leonard G. Abraham Prize in the Field of Communications Systems, 2011.
- *Laurea Honoris Causa*, Università degli Studi di Ferrara, 2008.
- Technical Recognition Award of the IEEE ComSoc Radio Communications Committee "for exceptional technical contributions to radio communications," 2008.
- IEEE Guglielmo Marconi Prize Paper Award in Wireless Communications, 2008.
- IEEE Eric E. Sumner Award, the IEEE Technical Field Award "for pioneering contributions to ultra-wide band communications science and technology," 2006.
- Fulbright Foundation Senior Scholar Fellowship Award, 2004.
- AIAA New England Section's Young Aerospace Engineer of the Year, 2004.
- Presidential Early Career Award for Scientists and Engineers (PECASE) from the United States White House, 2004.
- IEEE Antennas and Propagation Society Sergei A. Schelkunoff Transactions Prize Paper Award, 2003.

SELECTED PATENTS

- M. Z. Win, S. Mazuelas, and Y. Shen, "Tracking a body by nonlinear and non-Gaussian parametric filtering," U.S. Patent 9,062,978, Jun. 23, 2015.
- W. Suwansantisuk and M. Z. Win, "Method and apparatus for signal searching," U.S. Patent 8,565,690, Oct. 22, 2013.
- A. F. Molisch, M. V. Clark, H. Dai, M. Z. Win, and J. H. Winters, "Method and apparatus for reducing interference in multiple-input-multiple-output (MIMO) systems," U.S. Patent 7,912,014, Mar. 22, 2011.
- J. H. Winters, Y.-S. Choi, B.-J. J. Kim, A. F. Molisch, M. Z. Win, and H. Luo, "Method of selecting receive antennas for MIMO systems," U.S. Patent 7,006,810, Feb. 28, 2006.
- M. Z. Win and J. H. Winters, "Methods and systems for spatial processing," U.S. Patent 6,804,312, Oct. 12, 2004.

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