

Tristan J. Tayag

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EDUCATION:

Doctor of Philosophy in Electrical Engineering May 1991	University of Virginia Charlottesville, Virginia
Master of Science in Engineering May 1987	Johns Hopkins University Baltimore, Maryland
Bachelor of Science in Electrical Engineering (minor in German) May 1986	Johns Hopkins University Baltimore, Maryland

PROFESSIONAL POSITIONS:

Texas Christian University Fort Worth, Texas	Professor: June 2011-present Associate Professor: June 2002-May 2011 Assistant Professor: August 1997-May 2002
University of North Texas Health Science Center Fort Worth, Texas	Adjunct Clinical Associate Professor: Dept of Orthopaedic Surgery August 2008-present Adjunct Associate Professor: Dept of Cell Biology & Genetics August 2008-2011
United States Military Academy West Point, New York	ARL Visiting Scientist: EE&CS Department August 1996-June 1997
University of Maryland College Park, Maryland	Special Member of the Graduate Faculty 1997-1999
U.S. Army Research Laboratory Adelphi, Maryland	Electronics Engineer, GS-14: Optics Branch August 1991-July 1997
University of Oklahoma Norman, Oklahoma	Lecturer: Spring 1991 Research Scientist: September 1989-July 1991
University of Virginia Charlottesville, Virginia	Research Assistant: January 1988-August 1989 Teaching Assistant: Fall 1987
Johns Hopkins University Applied Physics Laboratory Laurel, Maryland	Associate Engineer: June 1986-August 1987 Technical Aide: Summer 1985
Westinghouse Electric Corp. Baltimore, Maryland	Internship Program: Spring 1985

PUBLICATIONS (PARTIAL LISTING):

Refereed Archival Journal Publications and Book Chapters:

1. R. Wagner, N. Lesley, R. E. Cote', and T. J. Tayag, "Evaluating factors affecting fixation strength of the patellar component of total knee arthroplasty," *Am. J. Orthopedics*, vol. 42, no. 9, pp. 424-429 (September 2013).
2. T. J. Tayag and R. C. Watson, "Digital demodulation of interferometric signals," invited book chapter in *Modern Metrology Concerns*, ISBN 979-953-307-336-0, InTech Publishers (May 2012).
Note: Over 1500 downloads by March 2014.
3. P. B. Wright, V. Kosmopoulos, R. E. Cote', T. J. Tayag, and A. D. Nana, "FiberWire is superior to stainless steel for tension band fixation of transverse patella fractures," *Injury*, vol. 40, no. 11, pp. 1200-1203 (November 2009).
4. R. E. Bunata, V. Kosmopoulos, S. Simmons, T. J. Tayag, M. Roso, and H. Carlson, "Primary tendon sheath enlargement and reconstruction in zone 2: an in vitro biomechanical study on tendon gliding resistance," *J. Hand Surgery*, vol. 34A, pp. 1436-1443 (October 2009).
5. T. J. Tayag, E. S. Kolesar, B. D. Pitt, K. S. Hoon, J. Marchetti, and I. H. Jafri, "An optical fiber interferometer for measuring the *in situ* deflection characteristics of MEMS structures," *Opt. Engineer.*, vol. 42, no. 1, pp. 105-111 (January 2003).
6. T. J. Tayag, "Quantum-noise-limited sensitivity of an interferometer using a phase generated carrier demodulation scheme," *Opt. Eng. Lett.*, vol. 41, no. 2, pp. 276-277 (February 2002).
7. T. J. Tayag, M. B. Steer, J. F. Harvey, A. B. Yakovlev, and J. Davis, "Spatial power splitting and combining based on the Talbot effect," *IEEE Microwave and Wireless Components Lett.*, vol. 12, no. 1, pp. 9-11 (January 2002).
8. D. M. Mackie, T. J. Tayag, and T. E. Batchman, "Polarization separation/combination based on self-imaging," *Opt. Engineer.*, vol. 40, no. 10, pp. 2265-2272 (October 2001).
9. L. J. Harrison, T. J. Tayag, G. J. Simonis, M. Stead, G. W. Euliss, and R. P. Leavitt, "Monolithic integration of 1.3 μm Stark-ladder electroabsorption waveguide modulators with multimode interference splitters," *IEEE Photonics Technol. Lett.*, vol. 12, no. 6, pp. 657-659 (June 2000).
10. S. Kareenahalli, M. Dagenais, D. Stone, and T. Tayag, "Experimental confirmation of phase relationships of multimode interference splitters using a shearing type near-field Sagnac interferometer," *IEEE Photon. Technol. Lett.*, vol. 9, no. 7, pp. 937-939 (July 1997).

Refereed Conference Proceedings:

1. T. J. Tayag, "The Capstone Design Experience Modeled as a Small Business Enterprise," accepted by Capstone Design Conference, Columbus, OH (June 2014).
2. Y. Simo and T. J. Tayag, "Non-uniform projection angle processing in computed tomography," in *Interferometry XVI: Applications*, edited by C. Furlong, C. Gorecki, and E. L. Novak, *Proceed. of SPIE*, vol. 8494, DOI: 10.1117/12.2000476 (2012).
3. T. J. Tayag, S. Dan Dimitrijevič, L. C. del Gallego, and P. Kumar, "Rotating Wall Vessel Designed for Fluorescent Imaging" in *Optical Interactions with Tissue and Cells XXII*, edited by E. D. Jansen and R. J. Thomas, *Proceed. of SPIE*, vol. 7897, CID 789718 (2011).
4. T. J. Tayag and B. Bachim, "Simulation of an Interferometric Computed Tomography System for Intraocular Lenses," in *Interferometry XV: Applications*, edited by C. Furlong, C. Gorecki, and E. L. Novak, *Proceed. of SPIE*, vol. 7791, CID 77910K-3 (2010).
5. T. J. Tayag, T. Htun, and E. S. Kolesar, "Integration of a low-cost fiber interferometer with a MEMS probe station," in *Interferometry XV: Applications*, edited by C. Furlong, C. Gorecki, and E. L. Novak, *Proceed. of SPIE*, vol. 7791, CID 77910R-1 (2010).
6. P. Kumar, A. Thomas, R. S. Weis, and T. J. Tayag, "Digital processing of an interferometric velocimeter for ballistic shock measurement" in *Optical Inspection and Metrology for Non-Optics Industries*, edited by P. S. Huang, T. Yoshizawa, and K. G. Harding, *Proceed. of SPIE*, vol. 7432, CID 74320K (2009).
7. P. B. Wright, V. Kosmopoulos, R. E. Cote', T. J. Tayag, and A. D. Nana, "FiberWire is superior to stainless steel for tension band fixation of transverse patella fractures," *Orthopaedic Research Society 55th*

Annual Meeting, Las Vegas, NV (February 2009).

8. S. Simmons, V. Kosmopoulos, M. Roso, H. Carlson, R. E. Cote', T. J. Tayag, and R. E. Bunata, "Enlarging and reconstructing the flexor tendon sheath reduces gliding resistance," *Orthopaedic Research Society 55th Annual Meeting*, Las Vegas, NV (February 2009).
9. R. A. Weber, T. J. Tayag, and L. J. Shannon, "Digital demodulation algorithm for the interferometric characterization of RF MEMS structures," in *Proceedings of the SPIE: Interferometry XII – Techniques and Analysis*, vol. 5531, pp. 315-322, Denver, CO (August 2004).
10. B. D. Pitt, T. J. Tayag, and M. L. Nelson, "Digital demodulation of an interferometer for the characterization of vibrating microstructures," in *Proceed. of the SPIE: Advanced Semiconductor Characterization Tech. for Optics, Semiconductors, and Nanotechnologies*, vol. 5188, pp. 61-70, San Diego, CA (August 2003).

Patents:

1. T. J. Tayag and C. A. Belk, "Method and system for stabilizing and demodulating an interferometer at quadrature," U. S. Patent No. 6,597,458 (July 2003).
2. T. J. Tayag and T. E. Batchman, "Self-imaging waveguide devices for wavelength division multiplexing applications," U. S. Patent No. 5,862,288 (issued 19 January 1999).
3. T. J. Tayag, "Easily manufacturable optical self-imaging waveguide devices," U.S. Patent No. 5,640,474 (issued 17 June 1997).

Paper Presentations and Workshops:

1. M. Antony, D. Burns, J. Pacheco, J. Myers, E. Simanek and T. Tayag, "The Digital Classroom: Teaching the Bohr Model at the Middle School level through an iPad Application," *Texas Christian University: Student Research Symposium*, Ft. Worth, TX (April 2013).
2. T. J. Tayag and S. D. Dimitrijevic, "Rotating Bioreactor for Real-time Image Analysis and Automated Control," *University of North Texas Health Science Center Technology Transfer and Commercialization Briefing*, Ft. Worth, TX (October 2009).
3. M. Hellman, M. Owings, V. Kosmopoulos, R. E. Cote', T. J. Tayag, and A. Nana, "Comparing Fatigue Between FiberWire and Stainless Steel for the Repair of Transverse Patella Fractures," *University of North Texas Health Science Center Research Appreciation Day*, Ft. Worth, TX (March 2009).
Notes: Awarded First Place for the Texas College of Osteopathic Medicine (TCOM) Poster and also
Awarded First Place for the TCOM Honors Student Poster
4. P. Kumar, A. Thomas, R. S. Weis, and T. J. Tayag, "Digital processing of an interferometric velocimeter for ballistic shock measurement," *Texas Christian University: Student Research Symposium*, Ft. Worth, TX (April 2009).
Note: Awarded Best Undergraduate Engineering Poster.
5. H. A. Carlson, S. Simmons, M. Roso, R. Bunata, T. J. Tayag, and R. Cote', "Gliding Resistance Testing System for Flexor Tendon Repair Research," *Texas Christian University: Student Research Symposium*, Ft. Worth, TX (April 2008).
Note: Awarded Best Undergraduate Engineering Poster.
6. L. C. Del Gallego, T. J. Tayag, and S. D. Dimitrijevic, "Dynamic Fluorescence Microscopy," *Texas Christian University: Student Research Symposium*, Ft. Worth, TX (April 2007).
Note: Awarded Best Undergraduate Engineering Poster.
7. C. S. Ghassemi, T. J. Tayag, and S. D. Dimitrijevic, "Optical Characterization of Human Tissue Equivalents," *Texas Christian University: Student Research Symposium*, Ft. Worth, TX (April 2006).
8. M. C. Johnson, T. J. Tayag, and S. D. Dimitrijevic, "Fluorescence Imaging within RWV Bioreactors," *Texas Christian University: Student Research Symposium*, Ft. Worth, TX (April 2006).
Note: Awarded Best Undergraduate Engineering Poster.
9. T. J. Tayag, M. C. Johnson, E. Ettingerand, and S. D. Dimitrijevic, "Feedback Optimization for Cell Aggregation – Tissue Growth in Rotating Wall Vessel Bioreactors," *University of North Texas Health Science Center: Research Appreciation Day*, Ft. Worth, TX (April 2006).
10. A. Chennareddy Gari and T. J. Tayag, "Computer simulation of a rotating wall vessel bioreactor," *IEEE MetroCon 2005*, Arlington, TX (September 2005).

Invited Presentations:

1. T. Tayag, "Case Study: TCU Capstone Design Project with Corning," invited presentation, *Thales Australia*, Sydney, Australia (June 2013).
2. T. Tayag, "Undergraduate Engineering Research at TCU," invited presentation, *Aerosonde, Inc.*, Notting Hill, Australia (June 2013).
3. T. Tayag, "Aerospace Research Projects at TCU," invited presentation, *Thales Australia*, Sydney, Australia (June 2013).
4. T. J. Tayag, "Electrical engineering technologies applied to problems in tissue science," *University of North Texas/Health Science Center: Guest Lecture Series*, Fort Worth, TX (December 2004).
5. T. J. Tayag, "Interferometric sensing of MEMS and biological structures," *Johns Hopkins University/Applied Physics Laboratory*, Laurel, MD (July 2003).
6. T. J. Tayag, "Optical MEMS Research at TCU: Low Frequency Sensor Applications," *Army Research Laboratory Internal Seminar*, Adelphi, MD (December 1997).
7. T. J. Tayag, "Talbot Effect Waveguide Devices for Optical Multiplexing Architectures," *LEOS Section Meeting*, Ft. Worth, TX (November, 1997).
8. T. J. Tayag, "Self-imaging Waveguide Research at the Army Research Laboratory," *University of Texas Austin, J. J. Pickle Research Center Seminar Series*, Austin, TX (April 1997).
9. T. J. Tayag, "ARL Research in Integrated Photonic Processing Systems," *University of Surrey EE Department Briefing*, Surrey, United Kingdom (June 1994).
10. T. J. Tayag, "Integrated Photonic Processing of Synthetic Aperture Radar Signals," *Defence Research Agency*, Malvern, United Kingdom (November 1993).

FUNDING SUPPORT (PARTIAL LISTING):

1. Bell Helicopter Textron, Inc., "Seeded Fault Test Rig," Educational Grant, PI: T. J. Tayag, August 2013-May 2014, \$16.2k
2. Bell Helicopter Textron, Inc., "Tactile Limit Cueing Actuation," PI: T. J. Tayag, January 2013-May 2014, \$80.0k
3. Corning Cable Systems, Inc., "Development of Curing Oven for Fiber Optic Connectors," Educational Grant, PI: T. J. Tayag, August 2012-May 2013, \$12.0k
4. Bell Helicopter Textron, Inc., "TCU Investigation of a Helmet Mounted Display – Phase 2," PI: T. J. Tayag, July 2010-April 2011, \$30.0k
5. Bell Helicopter Textron, Inc., "TCU Investigation of a Helmet Mounted Display," PI: T. J. Tayag, January 2010-June 2010, \$30.0k
6. University of North Texas Health Science Center and John Peter Smith Hospital, "Biomechanical Testing Using the MTS Mini Bionix Test System," PI: T. J. Tayag, December 2007-August 2008, \$30k
7. U. S. Army Aberdeen Test Center, "Ballistic Shock Measurement System Using Optical Fibers – Phase II" PI: R. S. Weis, Co-Investigator: T. J. Tayag, July 2007-September 2008, \$35.6k
8. U. S. Army Aberdeen Test Center, "Ballistic Shock Measurement System Using Optical Fibers," PI: R. S. Weis, Co-Investigator: T. J. Tayag, June 2006-May 2007, \$20k
9. Alcon Research, Ltd., "Modeling the Tomographic Reconstruction of an IOL," PI: T. J. Tayag, August 2006-February 2007, \$7k
10. Keyotee, Inc., "Fundamental Technology Development for a Light Projection Array," PIs: E. S. Kolesar and T. J. Tayag, August 2002-August 2003, \$32.0k
11. Weatherford Completion Systems (formerly CiDRA Optical Sensing Systems), "Interferometric Sensors," PI: R. S. Weis, Co-Investigator: T. J. Tayag, May 2001-December 2001, \$49.3k
12. U.S. Army Research Office, "Smart Sensors Based on Integrated Optics and Microelectromechanical Systems," PI: T. J. Tayag, September 1998-August 2002, \$77.9k
13. U.S. Army Research Office, "Design, Modeling, and Fab. of a Quasi-Optical Power Combiner Based on the Talbot Effect," PI: T. J. Tayag, July 1998-January 1999, \$10k
14. U.S. Army Research Laboratory, "Visiting Scientist at the U.S. Military Academy," Training/educational, PI: T. J. Tayag, August 1996-June 1997, \$70k

UNIVERSITY SERVICE (PARTIAL LISTING):

1. Co-Director: TCU Internationalization Laboratory, American Council on Education (2012-2014)
2. Appointed Member: TCU Global Citizenship 2020 Quality Enhancement Program (2012-2013)
3. Graduate Faculty, College of Science and Engineering (1998-2004, 2009-present)
4. TCU Laser Safety Officer (2009-present)
5. Curriculum Committee, TCU College of Science and Engineering (2000-2001, 2008-2010)
6. Tenure/Promotion Advisory Committee, TCU College of Science & Engineering (2006-2007)
7. Student Research Symposium Committee, TCU College of S&E, chair (2005), member (2004-2006)
8. TCU Mathematics Program Review Committee (2004-2005)
9. TCU Admissions and Retention Committee, co-chair (2006), member (2003-2008)
10. Jerry W. Allen Scholarship Committee, TCU Engineering Department (2006)

PROFESSIONAL SERVICE (PARTIAL LISTING):

1. Institute of Electrical and Electronic Engineers, senior member (since 2005)
2. SPIE – The International Society for Optical Engineering, member (since 2000)
3. American Society for Engineering Education, member (since 1998)
4. Optical Society of America, member (1989-2003)
5. Tau Beta Pi Engineering Honor Society, elected member (since 1985)
6. Eta Kappa Nu Electrical Engineering Honor Society, elected member (since 1985)
7. Delta Phi Alpha German Honor Society, elected member (since 1984)
8. IEEE MetroCON, Biotechnology Track, Arlington, TX Conference Chair, (2004-2012).
9. IEEE Ft. Worth Section, Acting-Secretary (2004).
10. Technical Manuscript/Textbook Reviewer:
 - AVS Journal of Vacuum Science and Technology*
 - IEEE Journal of Selected Topics in Quantum Electronics*
 - IEEE Transactions on Education*
 - McGraw-Hill Publisher*
 - OSA Applied Optics*
 - OSA Journal of the Optical Society of America A*
 - OSA Optics Express*
 - OSA Optics Letters*
 - Pearson Prentice-Hall Publisher*
 - SPIE Optical Engineering*

PROFESSIONALLY RELATED HONORS AND AWARDS (PARTIAL LISTING):

1. TCU Faculty Fellow in Entrepreneurship, *TCU Neeley Entrepreneurship Center*, Ft. Worth, TX (2010-2012)
2. Certificate of Appreciation, *IEEE MetroCon Executive Committee*, Fort Worth, TX (2009, 2010)
3. Outstanding Service Award, *IEEE Fort Worth Section* (2007)
4. Appreciation Award, MetroCon Track Chair, *IEEE Fort Worth Section* (2006, 2007)
5. Certificate of Appreciation, Career Day, *Bruce Shulkey Elementary School* (2007)
6. Dean's Appreciation Award, TCU CS&E, 2005 Student Research Symposium Chair (2005)
7. Asian American Chamber of Commerce, Awards Banquet Nomination, Education Category and Science and Technology Category (2002)
8. Research and Development Achievement Award, U. S. Army (1997)
9. Commander's Award for Civilian Service, United States Military Academy (1997)
10. U.S. Army Commendation, Army Research Laboratory, monetary award (1993)

PERSONAL DATA:

Date of Birth:	24 January 1964
Marital Status:	married with 2 daughters
Citizenship:	U.S.
Hobbies:	tennis, reading