Curriculum Vitæ

Tuba Yilmaz Abdolsaheb

Contact

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  Department of Electronics and Communications Engineering,
  Istanbul Technical University,
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Education

- Ph.D., Electronic Engineering. October 2009 – October 2013.
  Queen Mary, University of London London, U.K.
  Advisor: Prof. Yang Hao.

- M.S., Electrical Engineering. August 2007-August 2009.
  Mississippi State University Mississippi State, Mississippi, U.S.A.
  Advisor: Prof. Erdem Topsakal.
  Minor: Industrial Engineering

- B.S., Telecommunication Engineering. September 2003-July 2007.
  Istanbul Technical University Istanbul, Turkey.

Research Interests

- Bio-electromagnetics
- Antennas, analysis and design
- Dielectric spectroscopy

- Microwave Imaging
- Wireless power transfer

Professional Experience

- Istanbul Technical University Istanbul, Turkey.
  Assistant Professor November 2015-Present.
  - MIcrowave Diagnostics of breast cancer with open ended contact PRObes (MIDxPRO), *Principle Investigator*
  - Microwave imaging-guided portable hyperthermia device for breast cancer treatment, *Principle Investigator*
- Mitos Medical Technologies Istanbul, Turkey.
  Senior Research Associate December 2014-Novmber 2015.
  - Design of antennas for microwave breast cancer and stroke imaging.
- Utah State University Logan, Utah, U.S.A.
  Post-Doctoral Research Fellow October 2013-November 2014.
  - Designed deployable transmitter antennas for mid-power range RF wireless power transfer systems operating at 2.45 and 5.8 GHz Industrial, Scientific, Medical (ISM) Bands.
  - Implemented Particle Swarm Optimization (PSO) to optimize the performance of circular wireless power transfer systems for electric vehicles.
  - Advising a graduate student on Optimization of Circular Couplers for Wireless Power Transfer.
- Queen Mary, University of London London, U.K.
  Graduate Research Assistant October 2009-October 2013.
  - Characterized realistic glucose-dependent dielectric properties of blood mimicking materials.
  - Designed resonators for non-invasive sensing of the dielectric changes resulting from the glucose fluctuations in the blood.
  - Developed and experimentally validated a numerical method to retrieve the dielectric properties of the high loss materials at narrow band.
  - Characterized broad band tissue mimicking materials for testing of RF medical equipment.
  - Managed small scale human tests for non-invasive monitoring of blood glucose levels.
- Mississippi State University Mississippi State, Mississippi, U.S.A.
  Graduate Teaching Assistant August 2007-August 2009.

- Performed in-vitro testing of implantable antennas at medical, implant, communication (401-406 MHz) (MedRadio) and ISM (2.40-2.50 GHz) bands.
- Developed narrow band tissue mimicking materials for testing of implantable and on-body antennas and resonator.
- Designed and experimentally validated the performance of on-body antennas for wireless cardiac monitoring.
- Teaching Assistant for Electromagnetics I and Electromagnetics II courses.

Projects

- Microwave imaging-guided portable hyperthermia device for breast cancer treatment,(*TUBITAK SBAG 1003 Grant, Budget: 2.205.880 TL, 2018-2021, Principle Investigator)*
- MIcrowave Diagnostics of breast cancer with open ended contact PRObes (MIDxPRO), *(750346, H2020 – MSCA IF - RI Grant, Budget: 157,845 EUR, 2017-2019, Principle Investigator)*
- Development of Magnetic Nano-particle based Microwave Imaging Method, *(TUBITAK SBAG 1003 Grant, Budget: 1,500,000 TL, 2017-2020, Researcher)*
- Early diagnosis of brain Stroke: A Microwave Imaging System for Ambulances (KASK), *(Istanbul Development Agency, Budget: 875,312 TL, 2017-2018, Researcher)*

Publications

Book Chapters.

- Robert Foster, **Tuba Yilmaz**, Max Munoz and Yang Hao, "Wearable Sensors", in "Autonomous Sensor Networks: Collective Sensing Strategies for Analytical Purposes", Chapter 5, Daniel Filippini, Springer, 2013, ISBN-13 978-3642346477.

Peer-reviewed full journal papers

Indexed SCI/SCIE.

J1. Aleksandar Janjic, Mehmet Cayoren, Ibrahim Akduman, Tuba Yilmaz, Emre Onemli, Onur Bugdayci, Mustafa Erkin Aribal. "SAFE: A Novel Microwave Imaging System Design for Breast Cancer," *Diagnostics*, vol. 11, no. 3, pp. 533-543,. 2021.

J2. Gulsah Altintas, Ibrahim Akduman, Aleksandar Janic, **Tuba Yilmaz**. "A Novel Approach on Microwave Hyperthermia" *Diagnostics*, vol.11, no. 3: 493, 2021.

J3. Cemanur Aydinalp, Sulayman Joof, **Tuba Yilmaz**, " Towards Accurate Microwave Characterization of Tissues: Sensing Depth Analysis of Open-Ended Coaxial Probes with Ex Vivo Rat Breast and Skin Tissues" *Diagnostics*, vol.11, no. 2: 338, 2021.

J4. Cemanur Aydinalp, Sulayman Joof, **Tuba Yilmaz,** " Towards Non-Invasive Diagnosis of Skin Cancer: Sensing Depth Investigation of Open-Ended Coaxial Probes" *Sensors*, vol.21, no. 4: 1319, 2021.

J5. **Tuba Yilmaz** and Fatma Ates Alkan. "In Vivo Dielectric Properties of Healthy and Benign Rat Mammary Tissues from 500 MHz to 18 GHz," *Sensors*, vol 20, no. 8, pp. 2214, 2020.

J6. **Tuba Yilmaz**, "Multiclass Classification of Hepatic Anomalies with Dielectric Properties: From Phantom Materials to Rat Hepatic Tissues." *Sensors*, vol. 20, no. 2, pp. 530, 2020.

J7. **Tuba Yilmaz**, Banu Saçli, Gökhan Cansiz, Sulayman Joof, Cemanur Aydinalp, Mehmet Çayören, İbrahim Akduman, and Bülent Önal. "Microwave dielectric spectroscopy of renal calculi: A large scale study on dielectric properties from 500 MHz to 18 GHz, "*IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 26, no. 5 (2019): 1425-1433.

J8. Banu Sacli, Cemanur Aydınalp, Gökhan Cansız, Sulayman Joof, **Tuba Yilmaz**, Mehmet Çayören, Bülent Önal, and Ibrahim Akduman. "Microwave dielectric property based classification of renal calculi: Application of a kNN algorithm."*Computers in biology and medicine*, vol.112, pp. 103366, 2019.

J9. **Tuba Yilmaz**, Robert Foster, and Yang Hao. "Radio-frequency and microwave techniques for non-invasive measurement of blood glucose levels."*Diagnostics*, vol. 9, no1, pp. 6, 2019.

J10. **Tuba Yilmaz**, Nazmul Hasan, Regan Zane, Zeljko Pantic, "Multi-Objective Optimization of Circular Magnetic Couplers for Wireless Power Transfer Applications," IEEE Transactions on Magnetics, vol. 53, no. 8, pp 1-12, Aug. 2017.

J11. **Tuba Yilmaz**, Mahmut Alp Kilic, Melike Erdogan, Mehmet Cayoren et al. "Machine Learning Aided Diagnosis of Hepatic Malignancies Through In-vivo Dielectric Measurements with Microwaves,*" Physics in Medicine and Biology,* July 2016.

J12. **Tuba Yilmaz**, Robert Foster, Yang Hao, "Towards Accurate Dielectric Property Retrieval of Biological Tissues for Blood Glucose Monitoring," *IEEE Transactions on Microwave Theory and Techniques*, vol.62, no.12, pp.3193-3204, Dec. 2014.

J13. **Tuba Yilmaz**, Robert Foster, Yang Hao, "Broadband Tissue Mimicking Phantoms and a Patch Resonator for Evaluating Noninvasive Monitoring of Blood Glucose Levels," *IEEE Transactions on Antennas and Propagation*, vol.62, no.6, pp.3064-3075, June 2014.

J14. **Tuba Yilmaz**, Robert Foster, Yang Hao, "Detecting Vital Signs with Wearable Wireless Sensors," *Sensors 2010*, no. 12, pp. 10837-10862, 2010.

J15. **Tuba Yilmaz**, Tutku Karacolak, Erdem Topsakal, "Characterization and Testing of a Skin Mimicking Material for Implantable Antennas Operating at ISM Band (2.4 GHz - 2.48 GHz)," *IEEE Antennas and Wireless Propagation Letters*, IEEE, Vol. 7, pp. 418-420, 2008.

Indexed TR DIZIN

J16. Seda Keskin, **Tuba Yilmaz,** Tayfun Akgul "Preliminary Investigation of Hard and Soft Tissue Characterization with Microwave Dielectric Spectroscopy," *EMO Bilimsel Dergi,* 2021*,* (Accepted for publication).

J17. **Tuba Yilmaz**. "Microwave Spectroscopy Based Classification of Rat Hepatic Tissues: On the Significance of Dataset." *Balkan Journal of Electrical and Computer Engineering*, vol. 8, no. 4: 307-313.

Peer-reviewed conference proceedings.

C1. Aleksandar Janic, **Tuba Yilmaz**, Mehmet Çayören, Ibrahim Akduman, and Lorenzo Crocco. "Monitoring tumor response during chemotherapy treatment with Microwave Imaging." *In 2020 14th European Conference on Antennas and Propagation (EuCAP),* pp. 1-4. IEEE, 2020.

C2. Zeynep Macit, Cemanur Aydınalp, **Tuba Yilmaz**, Ayse Buse Ozdabak Sert, Fatma Nese Kok. "Broadband Microwave Dielectric Property Comparison of Human Fetal Osteoblastic (hFOB) and Osteosarcoma (SaOS-2) Cell Lines." *2020 14th European Conference on Antennas and Propagation (EuCAP).* IEEE, 2020.

C3. **Tuba Yilmaz**, "Microwave Dielectric Property Based Classification of Malignancies." In 2*019 International Conference on Electromagnetics in Advanced Applications (ICEAA)*, pp. 0443-0444. IEEE, 2019.

C4. Cemanur Aydinalp, Sulayman Joof, Ibrahim Akduman, and **Tuba Yilmaz**. "Sensitivity and Sensing Depth Analysis of Open-ended Contact Probes for Cancer Diagnosis." In *2019 PhotonIcs & Electromagnetics Research Symposium-Spring (PIERS-Spring)*, pp. 2523-2528. IEEE, 2019.

C5. Aydinalp, Cemanur, Sulayman Joof, **Tuba Yilmaz**, Nural Pastaci Özsobaci, Fatma Ateş Alkan, and Ibrahim Akduman. "In Vitro Dielectric Properties of Rat Skin Tissue for Microwave Skin Cancer Detection." In *2019 International Applied Computational Electromagnetics Society Symposium (ACES)*, pp. 1-2. IEEE, 2019.

C6. Zeynep Macit, Cemanur Aydınalp, Ayse Buse Ozdabak Sert, Fatma Nese Kok, and **Tuba Yilmaz**. "Microwave dielectric properties of osteosarcoma cell line

(SAOS-2) suspensions." *ICECOM 2019 - 23rd International Conference on Applied Electromagnetics and Communications (2019)*

C7. Cemanur Aydınalp, Sulayman Joof, and **Tuba Yilmaz**. "Sensing depth analysis of open-ended coaxial probe for skin cancer detection." *ICECOM 2019 - 23rd International Conference on Applied Electromagnetics and Communications (2019).*

C8. **Tuba Yilmaz**, Nural Pastaci Ozsobaci, Fatma Ates Alkan, Nuray Kepil, and Ibrahim Akduman. "In-vivo Microwave Dielectric Properties of Healthy and Carcinogenic Rat Nasal Tissues from 500 MHz to 6 GHz." In *2019 IEEE Conference on Antenna Measurements & Applications (CAMA)*, pp. 1-4. IEEE, 2019.

C9. Sulayman Joof, Gokhan Cansiz, Selcuk Ozgur, **Tuba Yilmaz**, Mehmet Cayoren, and Ibrahim Akduman. "Tissue Mimicking Phantoms for Microwave Brain Stroke Imaging." In *2018 18th Mediterranean Microwave Symposium (MMS)*, pp. 332-333. IEEE, 2018.

C10. **Tuba Yilmaz,** Mehmet Cayoren, Metin Acar, and Ibrahim Akduman. "Wideband Antennas for Microwave Brain Stroke Imaging." In *2018 IEEE International Symposium on Antennas and Propagation & USNC/URSI National Radio Science Meeting*, pp. 1143-1144. IEEE, 2018.

C11. **Tuba Yilmaz.** "Towards optimization of open ended contact probes for breast cancer diagnosis." In *2018 Progress in Electromagnetics Research Symposium (PIERS-Toyama)*, pp. 993-999. IEEE, 2018.

C12. **Tuba Yilmaz**, Tugce Ozturk, Saul Joof, " A Comparative Study for Development of Microwave Glucose Sensors*," 32nd URSI GASS, Montreal, 19-26 August 2017.* ***URSI Young Scientist Award***

C13. **Tuba Yilmaz**, Hulya Sahinturk, Metin Acar and Ibrahim Akduman, "Matching medium characterization for microwave brain stroke imaging," *2016 IEEE International Symposium on Antennas and Propagation (APSURSI)*, Fajardo, 2016, pp. 1485-1486.

C14. Kubra Cakmak, Tugce Ozturk, **Tuba Yilmaz** and Ibrahim Akduman, "Dielectric property measurements of dextrose solutions for RF sensor design," *2016 IEEE/ACES International Conference on Wireless Information Technology and Systems (ICWITS) and Applied Computational Electromagnetics (ACES)*, Honolulu, HI, 2016, pp. 1-2.

C15. Nazmul Hasan, **Tuba Yilmaz**, Regan Zane, Zeljko Pantic, "Multi-objective particle swarm optimization applied to the design of Wireless Power Transfer systems*," IEEE Wireless Power Transfer Conference (WPTC)*, pp.1-4, 13-15 May 2015.

C16. **Tuba Yilmaz**, Alessio Brizzi, Robert Foster, Max Munoz, Yang Hao, "A Patch Resonator for Sensing Blood Glucose Changes*," XXXI URSI General Assembly and Scientific Symposium (URSI GASS),* Beijing, China, August 2014.

C17. **Tuba Yilmaz**, Max Munoz, Robert Foster, Yang Hao, "Wearable Wireless Sensors*," International Workshop on Antenna Technology (IWAT),* Karlsruhe, Germany, March 2013. *(Invited Paper)*

C18. **Tuba Yilmaz,** Robert Foster, Yang Hao, "Patch Resonator for Non-Invasive Detection of Dielectric Property Changes in Biological Tissues," *IEEE International Symposium on Antennas and Propagation and USNC-URSI National Radio Science Meeting*, Chicago, IL, July 2012.

C19. Yang Hao, Alessio Brizzi, Robert Foster, et al., "Antennas and propagation for body-centric wireless communications: Current status, applications and future trend," *Electromagnetics; Application and Student Innovation (iWEM)*, *2012 IEEE International Workshop on*, vol., no., pp.1-2, 6-9 Aug. 2012.

C20. **Tuba Yilmaz** and Yang Hao, "Sensing of dielectric property alterations in biological tissues at microwave frequencies," *Antennas and Propagation Conference (LAPC), 2011 Loughborough*, vol., no., pp.1,4, 14-15 Nov. 2011, Loughborough, UK.

C21. **Tuba Yilmaz** and Yang Hao," Compact Resonators for Permittivity Reconstruction of Biological Tissues," *The XXX General Assembly of the International Union of Radio Science (URSI),* 2011, Istanbul, Turkey.

C22. **Tuba Yilmaz** and Yang Hao, "Electrical property characterization of blood glucose for on-body sensors," *Antennas and Propagation (EUCAP), Proceedings of the 5th European Conference on*, vol., no., pp.3659, 3662, Rome, Italy.

C23. Farshad Keshmiri, **Tuba Yilmaz,** Yang Hao, and Christophe Craeye, "MOM Analysis of Antenna Devoted to BAN," *Antennas and Propagation (EUCAP), Proceedings of the 5th European Conference on*, vol., no., pp.441,444, Rome, Italy.

C24. **Tuba Yilmaz**, Tutku Karacolak, Erdem Topsakal, "Characterization of Muscle and Fat Mimicking Gels at MICS and ISM Bands (402 MHz – 405 MHz) and (2.4 GHz – 2.48 GHz)," *The XXIX General Assembly of the International Union of Radio Science (URSI)*, August 07-17, 2008, Chicago, IL.

Conference presentations.

C25. **Tuba Yilmaz**, Reyhan Baktur, Regan Zane, "Design and Testing of Deployable Antennas for Wireless Charging of Low Power Sensors," *IEEE International Symposium on Antennas and Propagation and USNC-URSI National Radio Science Meeting*, Vancouver, BC, July 2015.

C26. **Tuba Yilmaz***, Max Munoz, Robert Foster, Yang Hao, "Towards Non-invasive and Continuous Monitoring of Vital Signs," *2nd Technical Enterprise Workshop on Today's RF Tomorrow's Medicine*, London, February 2013. ***2nd Runner up Prize***

C27. **Tuba Yilmaz*** and Yang Hao, "RF Devices for Chronic Disease Management," *Queen Mary, University of London Research Open Day 2012*, London, UK. ***Best Antenna Poster Award***

C28. **Tuba Yilmaz** and Yang Hao, "Non-invasive Sensing of Blood Glucose Using Wearable Microwave Sensors," *European Microwave Week 2011*, Manchester, UK.

C29. **Tuba Yilmaz*** and Yang Hao, "Enabling Microwave Devices for Chronic Disease Management," 24th. *London Hopper Colloquium*, 2011, London, UK. ***IBM Best Poster Award***

C30. **Tuba Yilmaz**, Tutku Karacolak, Erdem Topsakal, "A Three Layer Skin-Fat-Muscle Mimicking Gel Model for Testing of Implantable Antennas Operating at MICS(402 MHz- 405 MHz) and ISM (2.40 GHz – 2.48GHz) Bands," *Women in Electromagnetics (WiEM) Workshop*, 2009, Salt Lake City, UT.

C31. **Tuba Yilmaz**, Tutku Karacolak, Erdem Topsakal, "Body-Centric Antennas for Wireless Cardiac Monitoring*," National Radio Science Meeting, URSI*, January 5-8, 2009, Boulder.

C32. **Tuba Yilmaz**, Tutku Karacolak, Erdem Topsakal, "Characterization of Skin Mimicking Gels for Implantable Antennas Operating at ISM Band (2.4 GHz – 2.48 GHz)," *National Radio Science Meeting, URSI*, January 3-6, 2008, Boulder, CO.

C33. **Tuba Yilmaz**, Tutku Karacolak, Erdem Topsakal, "Characterization of Skin Mimicking Gels for MICS (402 MHz – 405 MHz) and ISM Band (2.4 GHz – 2.48 GHz*)," Mississippi Academy of Science Meeting*, February 20-22, 2008, Olive Branch, MS.

Invited Talks.

- Utah State University 18 March 2014.
  Logan, Utah, U.S.A.
  "RF Resonators for Non-invasive Monitoring of Blood Glucose Levels."

Qualifications

- Design and fabrication of microstrip antennas.
- Design and In-vivo/In-vitro testing of implantable/on-body antennas for bio-telemetry applications.
- Dielectric spectroscopy.
- Dielectric property re-construction through resonator measurements.

- Application of heuristic optimization techniques to electromagnetics: Particle Swarm Optimization (PSO).
- HFSS-Matlab and Maxwell-Matlab scripting.
- Managing MSc and PhD students.

Skills

- **Equipment**: Network analyzer, Agilent dielectric probe kit, Circuit board Milling Machine.
- **Simulation Software:** ANSYS High Frequency Structure Simulator (HFSS), MSC Patran, Computer Simulation Technology (CST), Agilent's Advanced Design System (ADS), COMSOL Multiphysics, ANSYS Maxwell.
- **Programming**: Matlab, C, Python.
- **Other:** Latex

Professional Activities

Reviewer

- IEEE Transactions on Medical Imaging (TMI)
- IEEE Transactions on Microwave Theory and Techniques (MTT).
- IEEE Transactions on Antennas and Propagation (TAP).
- IEEE Transactions on Instrumentation and Measurement (TIP).
- IEEE Transactions on Biomedical Engineering (TBME).
- IEEE Transactions on Dielectrics and Electrical Insulation (TDEI)
- IEEE Antennas and Wireless Propagation Letters (AWPL).
- IOP Science Physics in Medicine & Biology
- Elsevier Computers in Biology and Medicine

Honor Societies

- Eta Kappa Nu Electrical and Computer Engineering Honor Society.

Awards

- URSI Young Scientist Award, 2017.
- Marie Curie Individual Fellowship – Reintegration Grant, 2016.
- IET Today's RF Tomorrow's Medicine Workshop 2nd runner up prize, February, 2013.
- QMUL Postgraduate Fund Travel Grant, June, 2012.
- QMUL Research Open Day Best Antenna Poster Award, April, 2012.
- IBM Best Poster Award at London Hopper Colloquium, April, 2011.

- National Science Foundation Travel grant January 2008 and January 2009.
- Dean's honor list, Istanbul Technical University.

Trainings

- Teaching Skills Workshop in Queen Mary University of London, 2009.
- Teaching Assistant Workshop in Mississippi State University, 2007.

Civic Involvement

- Ph.D. Representative for Antennas Group (2011-2012)
  - Contributed to organization of Queen Mary University of London Research Open Day.
- Volunteering to translate TED talks to Turkish for STEM outreach.

Personal

- Gender female.
- Citizenship Turkey.
- Languages
  - Full professional proficiency in English.
  - Native Turkish speaker.