

## **Assoc. Prof. AHMET FATİH TABAK**

### **Personal Information**

**Web:** <https://www.webofscience.com/wos/author/record/R-9187-2018>

### **International Researcher IDs**

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Publons / Web Of Science ResearcherID: R-9187-2018

ScopusID: 16239623800

Yoksis Researcher ID: 110475

### **Education Information**

Post Doctorate, Max Planck Gesellschaft, Max Planck Institute for Intelligent Systems, Physical Intelligence, Germany 2014 - 2017

Doctorate, Sabanci University, Institute of Science, Mechatronics Engineering, Turkey 2007 - 2012

Postgraduate, Sabanci University, Institute of Science, Electrical Engineering and Computer Sciences, Turkey 2005 - 2007

Undergraduate, Sabanci University, Faculty of Engineering and Natural Sciences, Mechatronics Engineering, Turkey 2000 - 2005

### **Dissertations**

Doctorate, Computational and microhydrodynamic modeling and experiments with bio-inspired swimming robots in cylindrical channels, Sabanci University, Institute of Science, Mechatronics Engineering, 2012

Postgraduate, Simulation based experiments of traveling-plane-wave-actuator micropumps and microswimmers, Sabanci University, Institute of Science, Electrical Engineering and Computer Science, 2007

### **Research Areas**

Robotics and Mechatronics Systems, Micro and Nano Robots, Bioinstrumentation and Microelectromechanical Systems (MEMS), MEMS, Heat and Mass Transfer, Fluid Dynamics

### **Academic Titles / Tasks**

Associate Professor, Istanbul Commerce University, Mühendislik Fakültesi, Mekatronik Mühendisliği Bölümü, 2023 - Continues

Assistant Professor, Kadir Has University, Faculty of Engineering and Natural Sciences, Mechatronics Engineering, 2020 - 2023

Assistant Professor, Bahcesehir University, Faculty of Engineering and Natural Sciences, Mechatronics Engineering Department, 2018 - 2020

Assistant Professor, Istanbul Okan University, Faculty of Engineering and Natural Sciences, Mechatronics Engineering, 2017 - 2018

Researcher, Max Planck Gesellschaft, Max Planck Institute for Intelligent Systems, Physical Intelligence, 2014 - 2017

Assistant Professor, Istanbul Commerce University, Mühendislik Fakültesi, Mekatronik Mühendisliği Bölümü, 2012 - 2014

## Courses

Programming II, Undergraduate, 2023 - 2024  
Industrial Automation, Undergraduate, 2023 - 2024  
Graduation Project (3), Undergraduate, 2023 - 2024  
Engineering Optimization, Undergraduate, 2023 - 2024  
Programming I, Undergraduate, 2023 - 2024  
Mechatronics System Design II, Undergraduate, 2023 - 2024  
Mechatronics System Design I, Undergraduate, 2023 - 2024

## Published journal articles indexed by SCI, SSCI, and AHCI

- I. **MESENCHYMAL STEM CELL DIFFUSION INTEGRATED MECHANO- BIOLOGY ANALYSIS OF 3D SCAFFOLDS**  
Sahin M., Tabak A. F., Sendur G. K., Ghassabi A. A.  
TISSUE ENGINEERING - PART A, vol.29, no.11-12, pp.1391, 2023 (SCI-Expanded)
- II. **Transducer Technologies for Biosensors and Their Wearable Applications**  
Polat E. O., Cetin M. M., TABAK A. F., Güven E. B., Uysal B. Ö., Arsan T., Kabbani A., Hamed H., Gül S. B.  
Biosensors, vol.12, no.6, 2022 (SCI-Expanded)
- III. **Elevation and Azimuth Rotational Actuation of an Untethered Millirobot by MRI Gradient Coils**  
Erin O., Gilbert H. B., TABAK A. F., Sitti M.  
IEEE Transactions on Robotics, vol.35, no.6, pp.1323-1337, 2019 (SCI-Expanded)
- IV. **Temperature Gradients Drive Bulk Flow Within Microchannel Lined by Fluid-Fluid Interfaces**  
Amador G. J., Ren Z., TABAK A. F., Alapan Y., Yasa O., Sitti M.  
Small, vol.15, no.21, 2019 (SCI-Expanded)
- V. **3D-Printed Microbotic Transporters with Recapitulated Stem Cell Niche for Programmable and Active Cell Delivery**  
Yasa I. C., TABAK A. F., Yasa O., Ceylan H., Sitti M.  
Advanced Functional Materials, vol.29, no.17, 2019 (SCI-Expanded)
- VI. **3D-Printed Biodegradable Microswimmer for Theranostic Cargo Delivery and Release**  
Ceylan H., Yasa I. C., Yasa O., TABAK A. F., Giltinan J., Sitti M.  
ACS Nano, vol.13, no.3, pp.3353-3362, 2019 (SCI-Expanded)
- VII. **Hydrodynamic Impedance Correction for Reduced-Order Modeling of Spermatozoa-Like Soft Micro-Robots**  
TABAK A. F.  
Advanced Theory and Simulations, vol.2, no.2, 2019 (SCI-Expanded)
- VIII. **Controllable switching between planar and helical flagellar swimming of a soft robotic sperm**  
Khalil I. S., TABAK A. F., Seif M. A., Klingner A., Sitti M.  
PLoS ONE, vol.13, no.11, 2018 (SCI-Expanded)
- IX. **Soft erythrocyte-based bacterial microswimmers for cargo delivery**  
Alapan Y., Yasa O., Schauer O., Giltinan J., TABAK A. F., Sourjik V., Sitti M.  
Science Robotics, vol.3, no.17, 2018 (SCI-Expanded)
- X. **Swimming Back and Forth Using Planar Flagellar Propulsion at Low Reynolds Numbers**  
Khalil I. S. M., TABAK A. F., Hamed Y., Mitwally M. E., Tawakol M., Klingner A., Sitti M.  
Advanced Science, vol.5, no.2, 2018 (SCI-Expanded)
- XI. **Magnetic propulsion of robotic sperms at low-Reynolds number**  
Khalil I. S., TABAK A. F., Klingner A., Sitti M.

Applied Physics Letters, vol.109, no.3, 2016 (SCI-Expanded)

- XII. **Computationally-validated surrogate models for optimal geometric design of bio-inspired swimming robots: HELICAL swimmers**  
Tabak A. F., Yesilyurt S.  
Computers and Fluids, vol.99, pp.190-198, 2014 (SCI-Expanded)
- XIII. **Improved kinematic models for two-link helical micro/nanoswimmers**  
Tabak A. F., Yesilyurt S.  
IEEE Transactions on Robotics, vol.30, no.1, pp.14-25, 2014 (SCI-Expanded)
- XIV. **Simulation-based analysis of flow due to traveling-plane-wave deformations on elastic thin-film actuators in micropumps**  
TABAK A. F., Yesilyurt S.  
Microfluidics and Nanofluidics, vol.4, no.6, pp.489-500, 2008 (SCI-Expanded)

## Articles Published in Other Journals

- I. **Simulation Studies for Motion Control of Multiple Biohybrid Microrobots in Human Synovial Fluid with Discontinuous Reference Signals**  
TABAK A. F.  
International journal of advances in engineering and pure sciences (Online), vol.3, pp.1-9, 2021 (Peer-Reviewed Journal)
- II. **Non-Contact Micromanipulation Of A Single E. Coli Minicell**  
Sürer J., TABAK A. F.  
Avrupa Bilim ve Teknoloji Dergisi, no.26, pp.16-21, 2021 (Peer-Reviewed Journal)
- III. **Bernoulli-Equation-Based Robotic Model for Non-Contact Magnetic Micromanipulation**  
Sürer J., TABAK A. F.  
Avrupa Bilim ve Teknoloji Dergisi, no.24, pp.47-52, 2021 (Peer-Reviewed Journal)
- IV. **Bilateral control simulations for a pair of magnetically-coupled robotic arm and bacterium for in vivo applications**  
TABAK A. F.  
Journal of Micro-Bio Robotics, vol.16, no.2, pp.199-214, 2020 (ESCI)
- V. **Independent Joint Control Simulations on Adaptive Maneuvering of a Magnetotactic Bacterium via a Single Permanent Magnet**  
TABAK A. F.  
Avrupa Bilim ve Teknoloji Dergisi, vol.0, pp.50-59, 2020 (Peer-Reviewed Journal)
- VI. **Independent actuation of two-tailed microrobots**  
Khalil I. S., TABAK A. F., Hamed Y., Tawakol M., Klingner A., Gohary N. E., Mizaikoff B., SİTTİ M.  
IEEE Robotics and Automation Letters, vol.3, no.3, pp.1703-1710, 2018 (Scopus)
- VII. **Mechanical Rubbing of Blood Clots Using Helical Robots Under Ultrasound Guidance**  
Khalil I. S. M., Mandy D., El Sharkawy A., Moustafa R. R., TABAK A. F., Mitwall M. E., Hesham S., Hamdi N., Klingner A., Mohamed A., et al.  
IEEE Robotics and Automation Letters, vol.3, no.2, pp.1112-1119, 2018 (Scopus)
- VIII. **Hydrodynamic Impedance of Bacteria and Bacteria-Inspired Micro-Swimmers: A New Strategy to Predict Power Consumption of Swimming Micro-Robots for Real-Time Applications**  
Tabak A. F.  
Advanced Theory and Simulations, vol.1, no.4, 2018 (Scopus)
- IX. **Rubbing Against Blood Clots Using Helical Robots: Modeling and In Vitro Experimental Validation**  
Khalil I. S. M., TABAK A. F., Sadek K., Mahdy D., Hamdi N., SİTTİ M.  
IEEE Robotics and Automation Letters, vol.2, no.2, pp.927-934, 2017 (Scopus)

## Books & Book Chapters

- I. **Mathematical modeling to the motion control of magnetic nano/microrobotic tools performing in bodily fluids, especially blood/plasma**  
Tabak A. F.  
in: Nanotechnology for Hematology, Blood Transfusion, and Artificial Blood, Denizli,A,Nguyen,T A,Rajan,M,Alam,M F,Rahman K, Editor, Elsevier BV Academic Press, Amsterdam, pp.83-112, 2022
- II. **Chapter Twelve - Bioinspired and Biomimetic Micro-Robotics for Therapeutic Applications**  
TABAK A. F.  
in: Handbook of Biomechanics, Segil J, Editor, Elsevier Inc., Amsterdam, pp.457-523, 2019
- III. **Numerical experiment-based modeling for bio-inspired microswimmers: Modeling hydrodynamic interactions acting on individual bio-inspired microswimmer**  
TABAK A. F., YEŞİLYURT S.  
LAP Lambert Academic Publishing GmbH Co. KG., 2016
- IV. **Simulations on traveling-plane-wave-based micropumps and microswimmers: Modeling flow-fields and rigid-body kinematics of fully-submerged bio-inspired microsystems with deforming extremities**  
TABAK A. F., YEŞİLYURT S.  
LAP Lambert Academic Publishing GmbH Co. KG, 2016

## Refereed Congress / Symposium Publications in Proceedings

- I. **Analysis of functionally graded and uniform scaffolds based on mechano-biology and cell diffusion**  
ŞAHİN M., TABAK A. F., KIZILTAŞ ŞENDUR G.  
Virtual Physiological Human-VPH 2022, Porto, Portugal, 6 - 09 September 2022
- II. **Simulated Motion Control of a School of Microrobots with Random Walks**  
TABAK A. F.  
The IEEE (Türkiye Section) 6th International Symposium on Multidisciplinary Studies and Innovative Technologies (ISMSIT2022), Ankara, Turkey, 20 - 22 October 2021
- III. **Orbital characterization study for the hydrodynamic micro tweezers: simulated performance with a passive particle**  
Sürer J., DÜZENLİ S., TABAK A. F.  
The IEEE (Türkiye Section) 5th International Symposium on Multidisciplinary Studies and Innovative Technologies (ISMSIT2021), Bolu, Turkey, 21 - 23 October 2021
- IV. **Numerical Investigations on the Hydrodynamic Interaction between an E. Coli Minicell and a Micro Tweezers**  
TABAK A. F.  
The IEEE (Türkiye Section) Innovations in Intelligent Systems and Applications Conference (ASYU2021), Elazığ, Turkey, 6 - 08 October 2021
- V. **Orbital characterization study for the hydrodynamic micro tweezers: simulated performance with an active particle**  
DÜZENLİ S., Sürer J., TABAK A. F.  
The IEEE (Türkiye Section) 5th International Symposium on Multidisciplinary Studies and Innovative Technologies (ISMSIT2021), Bolu, Turkey, 21 - 23 October 2021
- VI. **Initial Study Towards the Integrated Design of Bone Scaffolds Based on Cell Diffusion, Growth Factor Release and Tissue Regeneration**  
ŞAHİN M., TABAK A. F., KIZILTAŞ ŞENDUR G.  
The ASME 2020 International Mechanical Engineering Congress and Exposition (IMECE), OR, Portland, United States Of America, 16 - 20 November 2020
- VII. **Motion Control for Biohybrid Multiscale Robots**  
TABAK A. F.

2020 Innovations in Intelligent Systems and Applications Conference, ASYU 2020, İstanbul, Turkey, 15 - 17 October 2020

- VIII. **A Simulated Control Method for a Magnetically-Coupled Bacterium and Robotic Arm**  
TABAK A. F.  
2020 International Conference on Manipulation, Automation, and Robotics at Small Scales, MARSS 2020, Toronto, Canada, 13 - 17 July 2020
- IX. **Simulated Bilateral Motion Control of a Magneto-Tactic Bacterium via an Open Kinematic Chain**  
TABAK A. F.  
17th International Conference on Ubiquitous Robots, UR 2020, Kyoto, Japan, 22 - 26 June 2020, pp.587-592
- X. **Adaptive Motion Control of Modified E. Coli**  
TABAK A. F.  
2nd International Congress on Human-Computer Interaction, Optimization and Robotic Applications, HORA 2020, Ankara, Turkey, 26 - 27 June 2020
- XI. **Manipulation of Non-Magnetic Microbeads Using Soft Microrobotic Sperm**  
El-Etriby A. E., Klingner A., TABAK A. F., Khalil I. S.  
3rd International Conference on Manipulation, Automation and Robotics at Small Scales, MARSS 2018, Nagoya, Japan, 4 - 08 July 2018
- XII. **Swimming in low reynolds numbers using planar and helical flagellar waves**  
Khalil I. S. M., TABAK A. F., Seif M. A., Klingner A., Adel B., Sitti M.  
2017 IEEE/RSJ International Conference on Intelligent Robots and Systems, IROS 2017, Vancouver, Canada, 24 - 28 September 2017, vol.2017-September, pp.1907-1912
- XIII. **Positioning of drug carriers using permanent magnet-based robotic system in three-dimensional space**  
Khalil I. S., Alfar A., TABAK A. F., Klingner A., Stramigioli S., Sitti M.  
2017 IEEE International Conference on Advanced Intelligent Mechatronics, AIM 2017, Munich, Germany, 3 - 07 July 2017, pp.1117-1122
- XIV. **Near-surface effects on the controlled motion of magnetotactic bacteria**  
Khalil I. S. M., TABAK A. F., Hageman T., Ewis M., Pichel M., Mitwally M. E., El-Din N. S., Abelman L., Sitti M.  
2017 IEEE International Conference on Robotics and Automation, ICRA 2017, Singapore, Singapore, 29 May - 03 June 2017, pp.5976-5982
- XV. **Targeting of cell mockups using sperm-shaped microrobots in vitro**  
Khalil I. S. M., TABAK A. F., Hosney A., Klingner A., Shalaby M., Abdel-Kader R. M., Serry M., Sitti M.  
6th IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechanics, BioRob 2016, Singapore, Singapore, 26 - 29 June 2016, vol.2016-July, pp.495-501
- XVI. **Sperm-shaped magnetic microrobots: Fabrication using electrospinning, modeling, and characterization**  
Khalil I. S. M., TABAK A. F., Hosney A., Mohamed A., Klingner A., Ghoneima M., Sitti M.  
2016 IEEE International Conference on Robotics and Automation, ICRA 2016, Stockholm, Sweden, 16 - 21 May 2016, vol.2016-June, pp.1939-1944
- XVII. **Dar kanallar içerisinde hareket eden manyetik mikro yüzücülerin direnç-kuvveti-teorisi tabanlı modellenmesi**  
Erman A. G., TABAK A. F.  
2014 Türkiye Otomatik Kontrol Ulusal Toplantısı (TOK), Kocaeli, Turkey, 11 - 13 September 2014
- XVIII. **Resistive force theory based modeling and simulation of surface contact for swimming helical micro robots with channel flow**  
Erman A., Tabak A. F.  
2014 IEEE/ASME International Conference on Advanced Intelligent Mechatronics, AIM 2014, Besançon, France, 8 - 11 July 2014, pp.390-395
- XIX. **In-channel experiments on vertical swimming with bacteria-like robots**  
Tabak A. F., Yesilyurt S.  
2013 26th IEEE/RSJ International Conference on Intelligent Robots and Systems: New Horizon, IROS 2013, Tokyo,

Japan, 3 - 08 November 2013, pp.4596-4601

- XX. **Yürüyen düzlem dalgaların piezoseramikler ile implementasyonu**  
TABAK A. F., BOZKURT A., YEŞİLYURT S.  
2013 Türkiye Otomatik Kontrol Ulusal Toplantısı, Malatya, Turkey, 26 - 30 September 2013
- XXI. **Experimental validation of a CFD-based resistive force coefficient set for rotating helical tails in cylindrical Channels**  
Tabak A. F., Yesilyurt S.  
7th Subrata Chakrabarti International Conference on Fluid Structure Interaction, FSI 2013, Gran Canaria, Spain, 10 - 12 April 2013, vol.129, pp.201-213
- XXII. **Experiments on in-channel swimming of an untethered biomimetic robot with different helical tails**  
TABAK A. F., Yesilyurt S.  
2012 4th IEEE RAS and EMBS International Conference on Biomedical Robotics and Biomechatronics, BioRob 2012, Rome, Italy, 24 - 27 June 2012, pp.556-561
- XXIII. **Experiment-based Kinematic validation of numeric modeling and simulated control of an untethered biomimetic Microrobot in channel**  
TABAK A. F., Yesilyurt S.  
2012 12th IEEE International Workshop on Advanced Motion Control, AMC 2012, Sarajevo, Bosnia And Herzegovina, 25 - 27 March 2012
- XXIV. **Comparison on experimental and numerical results for helical swimmers inside channels**  
TABAK A. F., Temel F. Z., Yesilyurt S.  
2011 IEEE/RSJ International Conference on Intelligent Robots and Systems: Celebrating 50 Years of Robotics, IROS'11, San Francisco, CA, United States Of America, 25 - 30 September 2011, pp.463-468
- XXV. **Validated reduced order models for simulating trajectories of bio-inspired artificial micro-swimmers**  
TABAK A. F., Yesilyurt S.  
ASME 2010 8th International Conference on Nanochannels, Microchannels, and Minichannels, ICNMM2010 Collocated with 3rd Joint US-European Fluids Engineering Summer Meeting, Montreal, Canada, 1 - 05 August 2010, pp.57-63
- XXVI. **Modeling and Simulations of the Motion of Bio-Inspired Micro Swimming Robots**  
TABAK A. F., YEŞİLYURT S.  
ASME 2010 First Global Congress on NanoEngineering for Medicine and Biology, Houston, Texas, United States Of America, 7 - 10 February 2010
- XXVII. **Simulation-based analysis of 3D flow inside a micropump with passive valves**  
TABAK A. F., Solak A., Erdem E., Akcan C., Yesilyurt S.  
ASME International Mechanical Engineering Congress and Exposition, IMECE 2007, Seattle, WA, United States Of America, 11 - 15 November 2007, vol.11 PART B, pp.849-856
- XXVIII. **Numerical analysis of a planar wave propagation based micropropulsion system**  
TABAK A. F., Yeşilyurt S.  
ASME International Mechanical Engineering Congress and Exposition, IMECE 2007, Seattle, WA, United States Of America, 11 - 15 November 2007, vol.11 PART B, pp.781-790
- XXIX. **Numerical Analysis of the 3D Flow Induced by Propagation of Plane-Wave Deformations on Thin Membranes Inside Microchannels**  
TABAK A. F., YEŞİLYURT S.  
ASME 5th International Conference on Nanochannels, Microchannels, and Minichannels (ICNMM), Puebla, Mexico, 18 - 20 June 2007
- XXX. **Numerical simulations and analysis of a micropump actuated by traveling plane waves**  
TABAK A. F., Yeşilyurt S.  
Microfluidics, BioMEMS, and Medical Microsystems V, San Jose, CA, United States Of America, 22 - 24 January 2007, vol.6465
- XXXI. **Simulation-based analysis of 3D flow inside a micropump with passive valves**  
TABAK A. F., Solak A., Erdem E., Akcan C., Yesilyurt S.  
ASME 2007 International Mechanical Engineering Congress and Exposition, IMECE 2007, Washington, United

States Of America, 11 - 15 November 2007, vol.11, pp.849-856

**XXXII. Numerical analysis of a planar wave propagation based micropropulsion system**

TABAK A. F., Yeşilyurt S.

ASME 2007 International Mechanical Engineering Congress and Exposition, IMECE 2007, Washington, United States Of America, 11 - 15 November 2007, vol.11, pp.781-790

## **Scientific Refereeing**

IEEE/ASME TRANSACTIONS ON MECHATRONICS, Journal Indexed in SCI-E, May 2024

IEEE/ASME TRANSACTIONS ON MECHATRONICS, Journal Indexed in SCI-E, May 2024

IEEE TRANSACTIONS ON ROBOTICS, Journal Indexed in SCI-E, May 2024

ADVANCED INTELLIGENT SYSTEMS, Journal Indexed in SCI-E, April 2024

FRONTIERS IN ROBOTICS AND AI, Journal Indexed in SCI-E, April 2024

IEEE/ASME TRANSACTIONS ON MECHATRONICS, Journal Indexed in SCI-E, April 2024

IEEE/ASME TRANSACTIONS ON MECHATRONICS, Journal Indexed in SCI-E, March 2024

IEEE/ASME TRANSACTIONS ON MECHATRONICS, Journal Indexed in SCI-E, March 2024

Frontiers in Energy Research, Journal Indexed in SCI-E, March 2024

FRONTIERS IN SENSORS, Journal Indexed in SCI-E, February 2024

IEEE Robotics and Automation Letters, Journal Indexed in SCI-E, February 2024

IEEE/ASME TRANSACTIONS ON MECHATRONICS, Journal Indexed in SCI-E, February 2024

IEEE/ASME TRANSACTIONS ON MECHATRONICS, Journal Indexed in SCI-E, January 2024

IEEE Robotics and Automation Letters, Journal Indexed in SCI-E, January 2024

IEEE/ASME TRANSACTIONS ON MECHATRONICS, Journal Indexed in SCI-E, December 2023

IEEE/ASME TRANSACTIONS ON MECHATRONICS, Journal Indexed in SCI-E, December 2023

IEEE/ASME TRANSACTIONS ON MECHATRONICS, Journal Indexed in SCI-E, December 2023

IEEE Robotics and Automation Letters, Journal Indexed in SCI-E, November 2023

FRONTIERS IN ROBOTICS AND AI, Journal Indexed in SCI-E, November 2023

IEEE Robotics and Automation Letters, Journal Indexed in SCI-E, November 2023

IEEE/ASME TRANSACTIONS ON MECHATRONICS, Journal Indexed in SCI-E, October 2023

FRONTIERS IN ROBOTICS AND AI, Journal Indexed in SCI-E, October 2023

## **Metrics**

Publication: 59

Citation (WoS): 1188

Citation (Scopus): 1352

H-Index (WoS): 13

H-Index (Scopus): 16

## **Non Academic Experience**

Ford Otosan