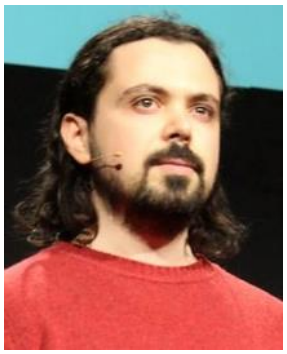
# Academic CV



**Dr. Ahmet Fatih Tabak, Ph.D.**

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## Academic & Work Experience

Assistant Professor: Mechatronics Engineering Department, Faculty of Engineering and Natural Sciences, Kadir Has University, Istanbul, Turkey, 09.2020 – Ongoing

Mechatronics Engineering Department, Faculty of Engineering and Natural Sciences, Bahcesehir University, Istanbul, Turkey, 09.2018 – 08.2020.

Mechatronics Engineering Department, Faculty of Engineering, Istanbul Okan University, Istanbul, Turkey, 11.2017 – 06.2018.

Mechatronics Engineering Department, Faculty of Engineering and Design, Istanbul Commerce University, Istanbul, Turkey, 12.2012 – 09.2014.

Postdoctoral Assoc.: Physical Intelligence Department, Max Planck Institute for Intelligent Systems, Stuttgart, Germany, 09.2014 – 09.2017 (End of hosting agreement) & 03.2018 (End of affiliation)

*Responsibilities:* Establishment of μPIV (4R07 - Bio-safety level 1) & CFD (4N07) labs, design/implementation of a computer-controlled mobile EM-field system, and organizational lead of microfluidics-subgroup at Physical Intelligence Department.

Researcher/PI: - *Fabrication of Optical-Vortex-Driven Micro-Motors*, Grassroots Initiative Program, Max Planck Institute for Intelligent Systems, Stuttgart, Germany, 10.2015 – 05.2017.
PIs: Dr. Ahmet Fatih Tabak (Abt. Sitti) & Dr. Kahraman Keskinbora (Abt. Schütz)

- *Study of Upstream Swimming Performance of Bacteria-like Robots*, Committee of Publication, Research, and Project Coordination (YAPKO), Istanbul Commerce University, Istanbul, Turkey, 09.2013 – 09.2014.
PI: Dr. Ahmet Fatih Tabak.

- *Visiting Researcher at PIV lab at Sabanci University Nanotechnology Research and Application Center* (SUNUM), Istanbul, Turkey. Fall 2013 – Spring 2014.

Teaching Assistant: Mechatronics Engineering Department, Sabanci University, Istanbul, Turkey, Fall 2005 – Spring 2012.

## Awards / Grants / Scholarships / Honors

2021 – Technical Committee of Micro/Nano Robotics and Automation, IEEE RAS
2020 – MARSS Program Committee Member
2020 – 2021 Frontiers in Robotics and AI, Research Topic Leading Guest Editor
2020 IEEE ASYU2020 'Best Paper Award', Istanbul, Turkey.
2018 IEEE ICRA2018 'Best Paper Award Finalist', Brisbane, Australia.

| | |
|---|---|
| 2016 | FameLab Germany: Karlsruhe 2016, 1st Place, British Council, Karlsruhe, Germany. |
| 2015 | Thesis in Three, Post-Doc Category, 2nd Place, MPI for IS, Stuttgart, Germany. |
| 2015 – 2017 | Grassroots Initiative Grant, MPI for Intelligent Systems, Stuttgart, Germany. |
| 2014 – 2017 | Max-Planck-Gesellschaft Postdoctoral Fellowship, Stuttgart, Germany. |
| 2013 | Subrata Chakrabarti Medal, Wessex Institute of Technology, Southampton, UK. |
| 2013 – 2014 | YAPKO Project Grant, Istanbul Commerce University, Istanbul, Turkey. |
| 2007 | Dr. Gürsel Sönmez Research Award, Sabanci University, Istanbul, Turkey. |
| 2007 | Successful Teaching Assistant Certificate, Sabanci University, Istanbul, Turkey. |
| 2007 – 2011 | Ph.D. Fellowship, Sabanci University, Istanbul, Turkey. |
| 2005 – 2007 | M.Sc. Fellowship, Sabanci University, Istanbul, Turkey. |
| 2000 – 2005 | Recognition Scholarship, Sabanci University, Istanbul, Turkey. |

## Education

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|---|---|
| 2014 – 2017 | Post-Doc in Medical Microrobotics, Physical Intelligence Department, Max Planck Institute for Intelligent Systems, Stuttgart, Germany.<br>*Post-Doc Advisor:* Dr. Metin Sitti |
| 2007 – 2012 | Ph.D. Mechatronics, Sabanci University, Istanbul.<br>*Thesis Advisor*: Dr. Serhat Yesilyurt<br>*Qualification Subjects*: Robotics (Dr. Kemalettin Erbatur), Thermal-Fluids Engineering (Dr. Ali Koşar), Microsystems Technologies (Dr. Ali Koşar), Real-Time Systems (Dr. Ahmet Onat), Mechanical Systems (Dr. Mahmut Faruk Akşit). |
| 2005 – 2007 | M.Sc. Electronics Engineering and Computer Science, Sabanci University, Istanbul.<br>*Thesis Advisor*: Dr. Serhat Yesilyurt |
| 2000 – 2005 | B.Sc. Mechatronics Engineering, Sabanci University, Istanbul.<br>*Graduation Project Advisors*: Dr. Kemalettin Erbatur, Dr. Mustafa Ünel |
| 1993 – 2000 | Lüleburgaz Anatolian High School, Kirklareli. |

## Publications*

Author Info:

IEEE/RAS ID: 145074
Loop ID: 507185
ORCID ID: 0000-0003-3311-6942
Scopus Author ID: 16239623800
Web of Science Researcher ID (Publons): R-9187-2018

Theses:

3) **A.F. Tabak**, Computational and microhydrodynamic modeling and experiments with bio-inspired swimming robots in cylindrical channels, Ph.D. Dissertation submitted to Graduate School of Science, Sabanci University, Istanbul, Spring 2012. **DOI**: 10.13140/2.1.4615.6483

2) **A.F. Tabak**, Simulation based experiments of travelling-plane-wave-actuator micropumps and microswimmers, M.Sc. Thesis submitted to Graduate School of Science, Sabanci University, Istanbul, Spring 2007. **DOI**: 10.13140/2.1.4877.7923

1) M. Fidanoğlu, **A.F. Tabak**, U. Tümerdem, H.A. Varol, Ball catching direct drive SCARA robot, B.Sc. Graduation Project Submitted to Faculty of Engineering and Natural Sciences, Sabanci University, Istanbul, Spring 2005. **DOI**: 10.13140/RG.2.1.2943.1206

Refereed International Journal Publications Listed in Scientific Indexes:

17) **A.F. Tabak**, "Bilateral Control Simulations for a Pair of Magnetically-Coupled Robotic Arm and Bacterium for In Vivo Applications," **Journal of Micro-Bio Robotics**, vol. 16, iss. 2, pp. 199-214, November, **2020**. **DOI**: 10.1007/s12213-020-00138-z

16) O. Erin, H.B. Gilbert, **A.F. Tabak**, M. Sitti, "Elevation and azimuth rotational actuation of an untethered millirobot by MRI gradient coils," **IEEE Transactions on Robotics**, vol. 35, iss. 6, pp. 1323 – 1337, December, **2019**. **DOI**: 10.1109/TRO.2019.2934712

15) I.C. Yasa, **A.F. Tabak**, O. Yasa, H. Ceylan, M. Sitti, "3D-printed microrobotic transporters with recapitulated stem cell niche for programmable and active cell delivery," **Advanced Functional Materials**, vol. 29, iss. 17, pp. 1808992-1 – 1808992-10, May, **2019**. **DOI**: 10.1002/adfm.201808992

14) G.J. Amador, Z. Ren, **A.F. Tabak**, Y. Alapan, O. Yasa, M. Sitti, "Temperature gradients drive bulk flow within microchannel lined by fluid-fluid interfaces," **Small**, vol. 15, iss. 21, pp. 1900472-1 – 1900472-8, May, **2019**. **DOI**: 10.1002/smll.201900472

13) H. Ceylan, I.C. Yasa, **A.F. Tabak**, J. Giltinan, M. Sitti, "3D-printed biodegradable microswimmer for theranostic cargo delivery and release," **ACS Nano**, vol. 13, iss. 3, pp. 3353 – 3362, February, **2019**. **DOI**: 10.1021/acsnano.8b09233

12) **A.F. Tabak**, "Hydrodynamic impedance correction for reduced-order modeling of spermatozoa-like soft micro-robots," **Advanced Theory and Simulations**, vol. 2, iss. 2, pp. 1800130-1 – 1800130-10, February, **2019**. **DOI**: 10.1002/adts.201800130

11) I.S.M. Khalil, **A.F. Tabak**, M.A. Seif, A. Klingner, M. Sitti, "Controllable switching between planar and helical flagellar swimming of a soft robotic sperm," **PLOS ONE**, vol. 13, iss. 11, pp. e0206456-1 – e0206456-15, November, **2018**. **DOI**: 10.1371/journal.pone.0206456

10) I.S.M. Khalil, **A.F. Tabak**, Y. Hamed, M. Tawakol, A. Klingner, N.A. El Gohary, B. Mizaikoff, M. Sitti, "Independent actuation of two-tailed microrobots," **IEEE Robotics and Automation Letters**, vol. 3, iss. 3, pp. 1703 – 1710, July, **2018**. **DOI**: 10.1109/LRA.2018.2801793 (was also presented at IEEE **ICRA2018**)

9) Y. Alapan, O. Yasa, O. Schauer, J. Giltinan, **A.F. Tabak**, V. Sourjik, M. Sitti, "Soft Erythrocyte-based bacterial microswimmers for cargo delivery," **Science Robotics**, vol. 3, iss. 17, pp. eaar4423-1 – eaar4423-10, April, **2018**. **DOI:** 10.1126/scirobotics.aar4423

8) **A.F. Tabak**, "Hydrodynamic impedance of bacteria and bacteria-inspired micro-swimmers: A new strategy to predict power consumption of swimming micro-robots for real-time applications," **Advanced Theory and Simulations**, vol. 1, iss. 4, 1700013-1 – 1700013-10, April, **2018**. **DOI**: 10.1002/adts.201700013

7) I.S.M. Khalil, D. Mahdy, A. El-Sharkawy, R. Moustafa, **A.F. Tabak**, M. Mitwally, S.H. El Feshawy, N. Hamdi, A. Klingner, A. Mohamed, M. Sitti, "Mechanical rubbing of blood clots using helical robots under ultrasound guidance," **IEEE Robotics and Automation Letters**, vol. 3, iss. 2, pp. 1112 – 1119, April, **2018**. **DOI**: 10.1109/LRA.2018.2792156 (was also presented at IEEE **ICRA2018** & nominated for the best paper award.)

6) I.S.M. Khalil, **A.F. Tabak**, Y. Hamed, M. Elwi, M. Tawakol, M. Sitti, "Swimming back and forth using planar flagellar propulsion at low Reynolds numbers," **Advanced Science**, vol. 5, iss. 2, pp. 1700461-1 – 1700461-9, February, **2018**. **DOI**: 10.1002/advs.201700461

5) I.S.M. Khalil, **A.F. Tabak**, K. Sadek, D. Mahdy, N. Hamdi, M. Sitti, "Rubbing against blood clots using helical robots: modeling and *in vitro* experimental validation," **IEEE Robotics and Automation Letters**, vol. 2, iss. 2, pp. 927–934, April, **2017**. **DOI**: 10.1109/LRA.2017.2654546 (was also presented at IEEE **ICRA2017**)

4) I.S.M. Khalil, **A.F. Tabak**, A. Klingner, M. Sitti, "Magnetic propulsion of robotic sperms at low-Reynolds number," **Applied Physics Letters**, vol. 109, no. 3, pp. 033701-1 – 033701-5, July, **2016**. **DOI**: 10.1063/1.4958737

3) **A.F. Tabak**, S. Yesilyurt, "Computationally-validated surrogate models for optimal geometric design of bio-inspired swimming robots: helical swimmers," **Computers and Fluids**, vol. 99, pp. 190–198, July, **2014**. **DOI**: 10.1016/j.compfluid.2014.04.033

2) **A.F. Tabak**, S. Yesilyurt, "Improved kinematic models for two-link helical micro/nanoswimmers," **IEEE Transactions on Robotics**, Special Issue on Nanorobotics, vol. 30, no. 1, pp. 14–25, February, **2014**. **DOI**: 10.1109/TRO.2013.2281551

1) **A.F. Tabak**, S. Yesilyurt, "Simulation-based analysis of flow due to traveling-plane-wave deformations on elastic thin-film actuators in micropumps," **Microfluidics and Nanofluidics**, vol. 4, no. 6, pp. 489–500, June, **2008**. **DOI**: 10.1007/s10404-007-0207-y

Books & Book Chapters:

5) **A.F. Tabak**, Chapter 5: *Mathematical modeling to the motion control of magnetic nano/micro-robotic tools performing in bodily fluids, especially blood/plasma*, in: Nanotechnology for Hematology, Blood Transfusion, and Artificial Blood, 1st Ed., A. Denizli, T.A. Nguyen, M. Rajan. M.F. Alam, K. Rahman, Ed., **Elsevier BV Academic Press**, ch. 5, pp. 83-112, **2022**. **ISBN:** 978-0-12-823-971-1 **DOI**: 10.1016/B978-0-12-823971-1.00004-0 (Online: October 2021; Print: 2022)

4) **A.F. Tabak**, Chapter 12: *Bioinspired and biomimetic micro-robotics for therapeutic applications*, in: Handbook of Biomechatronics, 1st Ed., J. Segil, Ed., **Elsevier BV Academic Press**, pt. 2, ch. 12, pp. 457 – 523, **2019**. **ISBN**: 978-0-12-812539-7 **DOI**: 10.1016/B978-0-12-812539-7.00010-6 (Online: December 2018; Print: 2019)

3) **A.F. Tabak**, S. Yesilyurt, *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*, **LAP Lambert Academic Publishing GmbH & Co. KG.**, September, **2016**. **ISBN**: 978-3-659-94808-4

2) **A.F. Tabak**, S. Yesilyurt, *Numerical & experiment-based modeling for bio-inspired microswimmers: Modeling hydrodynamic interactions acting on individual bio-inspired microswimmer*, **LAP Lambert Academic Publishing GmbH & Co. KG.**, May, **2016**. **ISBN**: 978-3-659-88616-4

1) **A.F. Tabak**, S. Yesilyurt, "Experimental validation of a CFD-based resistive force coefficient set for rotating helical tails in cylindrical channels," **WIT Transactions on The Built Environment**, vol. 129, pp. 201 – 213, April, **2013**. **DOI**: 10.2495/FSI130181 **ISBN**: 978-1-84564-700-1 (was presented at **FSI2013** first & received the best paper award.)

Talks & Videos on YouTube:

7) https://www.youtube.com/watch?v=z8XSOLwsNt4 (May, **2018**, Brisbane, Australia)
6) https://www.youtube.com/watch?v=Oh-m0tZaBko (May, **2018**, Brisbane, Australia)
5) https://www.youtube.com/watch?v=DdP3yUocQ_0 (May, **2018**, Brisbane, Australia)
4) https://www.youtube.com/watch?v=5EIAGsc4cR0 (April, **2018**, Science Robotics)
3) https://www.youtube.com/watch?v=_IahMtxYJ_0 (April 12, **2016**, Bielefeld, Germany)
2) https://www.youtube.com/watch?v=iAE1Kx7opjk (March 16, **2016**, Karlsruhe, Germany)
1) https://www.youtube.com/watch?v=2hY79gyuVRs (March 16, **2016**, Karlsruhe, Germany)

Full-Length Papers in International Conference Proceedings:

21) M. Sahin, **A.F. Tabak**, G. Kiziltas-Sendur, "Initial Study Towards the Integrated Design of Bone Scaffolds Based on Cell Diffusion, Growth Factor Release and Tissue Regeneration," Proceedings of The ASME 2020 International Mechanical Engineering Congress and Exposition (**IMECE2020**), Portland, OR, USA, Volume 5: Biomedical and Biotechnology, November **2020**. **DOI**: 10.1115/IMECE2020-23940

20) **A.F. Tabak**, "A simulated control method for a magnetically-coupled bacterium and robotic arm," Proceedings of The 5th IEEE International Conference on Manipulation, Automation and Robotics at Small Scales (**MARSS2020**), Toronto, Canada, July **2020**. **DOI:** 10.1109/MARSS49294.2020.9307851

19) **A.F. Tabak**, "Simulated bilateral motion control of a magneto-tactic bacterium via an open kinematic chain," Proceedings of The 17th IEEE International Conference on Ubiquitous Robots (**UR2020**), Kyoto, Japan, June **2020**. **DOI**: 0.1109/UR49135.2020.9144834

18) A. Ezz, A. Klingner, **A.F. Tabak**, I.S.M. Khalil, "Manipulation of non-magnetic microbeads using soft microrobotic sperm," Proceedings of The IEEE International Conference on Manipulation, Automation and Robotics at Small Scales (**MARSS2018**), Special Session on Swimming Microrobots, Nagoya, Japan, July, **2018**. **DOI**: 10.1109/MARSS.2018.8481164

17) I.S.M. Khalil, **A.F. Tabak**, M.A. Sief, A. Klingner, B. Adel, M. Sitti, "Swimming in low Reynolds numbers using planar and helical flagellar waves," Proceedings of The 2017 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS2017**), Vancouver, BC, Canada, September, **2017**, pp. 1907-1912. **DOI**: 10.1109/IROS.2017.8206009

16) I.S.M. Khalil, A. Alfar, **A.F. Tabak**, A. Klingner, S. Stramigioli, M. Sitti, "Positioning of drug carriers using permanent magnet-based robotic system in three-dimensional space," Proceedings of The IEEE/ASME International Conference on Advanced Intelligent Mechatronics (**AIM2017**), Munich, Germany, July, **2017**, pp. 1117-1122. **DOI**: 10.1109/AIM.2017.8014168

15) I.S.M. Khalil, **A.F. Tabak**, T. Hageman, M. Ewis, M. Pichel, M.E. Mitwally, N.S. El-Din, L. Abelmann, M. Sitti, "Near-surface effects on the controlled motion of magnetotactic bacteria," Proceedings of The 2017 IEEE International Conference on Robotics and Automation (**ICRA2017**), Singapore, May-June, **2017**, pp. 5776-5982. **DOI**: 10.1109/ICRA.2017.7989705

14) I.S.M. Khalil, **A.F. Tabak**, A. Hosney, A. Klingner, M. Shalaby, R.M. Abdel-Kader, M. Serry, M. Sitti, "Targeting of cell mockups using sperm-shaped microrobots *in vitro*," Proceedings of The 6th IEEE RAS & EMBS International Conference on Biomedical Robotics and Biomechatronics (**BIOROB2016**), Singapore, June, **2016**, pp. 495-501. **DOI**: 10.1109/BIOROB.2016.7523675

13) I.S.M. Khalil, **A.F. Tabak**, A. Hosney, A. Mohamed, A. Klingner, M. Ghoneima, M. Sitti, "Sperm-shaped magnetic microrobots: Fabrication using electrospinning, modeling, and characterization," Proceedings of The 2016 IEEE International Conference on Robotics and Automation (**ICRA2016**), Stockholm, Sweden, May, **2016**, pp. 1939-1944. **DOI**: 10.1109/ICRA.2016.7487340

12) A.G. Erman, **A.F. Tabak**, "Resistive force theory based modeling and simulation of surface contact for swimming helical micro robots with channel flow," Proceedings of The 2014 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (**AIM2014**), Besançon, France, July, **2014**, pp. 390-395. **DOI**: 10.1109/AIM.2014.6878110

11) **A.F. Tabak**, S. Yesilyurt, "In-channel experiments on vertical swimming with bacteria-like robots," Proceedings of The 2013 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS2013**), Tokyo, Japan, November, **2013**, pp. 4596-4601. **DOI**: 10.1109/IROS.2013.6697017

10) F.Z. Temel, O. Erin, **A.F. Tabak**, S. Yesilyurt, "Bio-inspired micro robots swimming in channels," Proceedings of The 13th Mechatronics Forum Biennial International Conference (**MECHATRONICS2012**), Linz, Austria, September, **2012**. **ISBN**: 978-3-99033-046-3

9) **A.F. Tabak**, S. Yesilyurt, "Experiments on in-channel swimming of an untethered biomimetic robot with different helical tails," Proceedings of The 4th IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (**BIOROB2012**), Rome, Italy, June, **2012**, pp. 556-561. **DOI**: 10.1109/BioRob.2012.6290834

8) **A.F. Tabak**, S. Yesilyurt, "Experiment-based kinematic validation of numeric modeling and simulated control of an untethered biomimetic microrobot in channel," Proceedings of The 12th IEEE International Workshop on Advanced Motion Control (**AMC2012**), Sarajevo, Bosnia and Herzegovina, March, **2012**, pp. 1-6. **DOI**: 10.1109/AMC.2012.6197094

7) **A.F. Tabak**, F.Z. Temel, S. Yesilyurt, "Comparison on experimental and numerical results for helical swimmers inside channels," Proceedings of The 2011 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS2011**), San Francisco, California, USA, September, **2011**, pp. 463-468. **DOI**: 10.1109/IROS.2011.6094620

6) **A.F. Tabak**, S. Yesilyurt, "Validated reduced order models for simulating trajectories of bio-inspired artificial micro-swimmers," Proceedings of The ASME 3rd Joint US-European Fluids

Engineering Summer Meeting and 8th International Conference on Nanochannels, Microchannels and Minichannels (**FEDSM2010-ICNMM2010**), Montreal, Canada, August, **2010**, pp. 57-63. **DOI**: 10.1115/FEDSM-ICNMM2010-30857

5) **A.F. Tabak**, S. Yesilyurt, "Numerical analysis of a planar wave propagation based micropropulsion system," Proceedings of The ASME International Mechanical Engineering Congress and Exhibition (**IMECE2007**), Seattle, USA, November, **2007**. **DOI**: 10.1115/IMECE2007-41604

4) **A.F. Tabak**, A. Solak, E.Y. Erdem, C. Akcan, S. Yesilyurt, "Simulation-based analysis of 3D flow inside a micropump with passive valves," Proceedings of The ASME International Mechanical Engineering Congress and Exhibition (**IMECE2007**), Seattle, USA, November, **2007**. **DOI**: 10.1115/IMECE2007-42037

3) **A.F. Tabak**, S. Yesilyurt, "Numerical analysis of the 3D flow induced by propagation of plane-wave deformations on thin membranes inside microchannels," Proceedings of The ASME 5th International Conference on Nanochannels, Microchannels & Minichannels, (**ICNMM2007**), Puebla, Mexico, June, **2007**. **DOI**: 10.1115/ICNMM2007-30135

2) **A.F. Tabak**, S. Yesilyurt, "Numerical simulations and analysis of a micropump actuated by traveling plane waves," Proceedings of The 2007 SPIE-Photonics West, (**MOEMS-MEMS2007**), San Jose, California, USA, January, **2007**. **DOI**: 10.1117/12.702320

1) **A.F. Tabak**, S. Yesilyurt, "Numerical simulations of a traveling plane-wave actuator for microfluidic applications," Proceedings of The **COMSOL Users Conference**, ed. Jeri'Ann Hiller, Boston, MA, USA, October, **2006**. **ISBN**: 0-9766792-2-1

Extended Abstracts in International Conferences and Workshops:

4) F.G. Ergin, **A.F. Tabak**, W. Wang, M. Sitti, "Time-resolved measurements of the free surface motion due to spinning micro-rafts using stereo microPIV," Proceedings of The 12th International Symposium on Particle Image Velocimetry (**ISPIV**), Pusan, Korea, June, **2017**. (Available at WWW)

3) **A.F. Tabak**, G. Amador, M. Sitti, "Modeling 6-dof rigid-body motion of a thermocapillary microswimmer," Proceedings of **COMSOL User Conference** 2016 Munich, Germany, October, **2016**. (Available at WWW)

2) G.J. Amador, W. Hu, **A.F. Tabak**, M. Sitti, "Submerged thermocapillary microswimmer," Proceedings of The 1st International Conference on Multiscale Applications of Surface Tension (**microMAST2016**), Brussels, Belgium, September, **2016**. (Program is available at WWW)

1) **A.F. Tabak**, S. Yesilyurt, "Modeling and simulations of the motion of bio-inspired microswimming robots," Proceedings of The ASME First Global Congress on Nanoengineering for Medicine and Biology (**NEMB2010**), Houston, TX, USA, February, **2010**. **DOI**: 10.1115/NEMB2010-13268

Poster Presentations in International Conferences and Workshops:

3) M. Amjadi, B. Mostaghaci, **A.F. Tabak**, M. Sitti, "A microfluidic system for controllable fabrication of bacteriabots," **Max Planck-ETH Center for Learning Systems Workshop on Biomedical Micro/Nanosystems Engineering**, Ringberg Castle, Germany, September, **2016**.

2) **A. F. Tabak**, I.S.M. Khalil, M. Sitti, "Computational modeling of magnetic microswimmers with flexible body," **The 2016 SAB Meeting for Max Planck Institute for Intelligent Systems**, Stuttgart, Germany, April, **2016**.

1) B.-W. Park, B. Mostaghaci, O. Yasa, **A.F. Tabak**, A.V. Singh, Z. Hosseini-Doust, S. Zakharchenko, H. Ceylan, I.C. Garip-Yasa, Y. Yakupoglu, A. Akay, J. Zhang, M. Sitti, "The tactic behavior of bioinspired and synthetic microswimmers," In: Microswimmiers – From Single Particle Motion to Collective Behavior, **Microswimmers Summer School** 2015, Jülich, Germany, September, **2015**.

Refereed National Journal Publications (TR-Dizin):

4) **A.F. Tabak**, "Simulation Studies for Motion Control of Multiple Biohybrid Microrobots in Human Synovial Fluid with Discontinuous Reference Signals," **International Journal of Advances in Engineering and Pure Sciences**, July, 2022, (In Print) **DOI:** TBA

3) J. Sürer, **A.F. Tabak**, "Non-Contact Micromanipulation of a Single E. Coli Minicell," **European Journal of Science and Technology**, iss. 26, pp. 16-21, May, **2021**. **DOI**: 10.31590/ejosat.944340

2) J. Sürer, **A.F. Tabak**, "Bernoulli-equation-based robotic model for non-contact magnetic micromanipulation," **European Journal of Science and Technology**, iss. 24, pp. 47-52, March, **2021**. **DOI**: 10.31590/ejosat.899657

1) **A.F. Tabak**, "Independent joint control simulations on adaptive maneuvering of a magnetotactic bacterium via a single permanent magnet," **European Journal of Science and Technology**, Special Issue, pp. 50-59, November, **2020**. **DOI**: 10.31590/ejosat.818986

Full Length Papers in National Conferences:

6) S. Düzenli, J. Sürer, **A.F. Tabak**, "Orbital Characterization Study for the Hydrodynamic Micro Tweezers: Simulated Performance with an Active Particle," Proceedings of The IEEE (Turkey Section) 5th International Symposium on Multidisciplinary Studies and Innovative Technologies (**ISMSIT2021**), Bolu, Turkey, October **2021**. (Accepted) **DOI**: TBA

5) **A.F. Tabak**, "Numerical Investigations on the Hydrodynamic Interaction between an E. Coli Minicell and a Micro Tweezers," Proceedings of The IEEE (Turkey Section) Innovations in Intelligent Systems and Applications Conference (**ASYU2021**), Elazığ, Turkey, October **2021**. (Accepted) **DOI**: TBA

4) **A.F. Tabak**, "Motion control for biohybrid multiscale robots," Proceedings of The IEEE (Turkey Section) Innovations in Intelligent Systems and Applications Conference (**ASYU2020**), Istanbul, Turkey, October **2020**. (Received the Best Paper Award) **DOI**: 10.1109/ASYU50717.2020.9259857

3) **A.F. Tabak**, "Adaptive motion control of modified *e. coli*," Proceedings of The 2nd IEEE (Turkey Section) International Congress on Human-Computer Interaction, Optimization, and Robotic Applications (**HORA2020**), Ankara, Turkey, June **2020**. **DOI**: 10.1109/HORA49412.2020.9152603

2) A.G. Erman, **A.F. Tabak**, "Dar kanallar içerisinde hareket eden manyetik mikro yüzücülerin direnç-kuvveti-teorisi tabanlı modellemesi," Proceedings of The 15th National Conference on Automatic Control (**TOK2014**), Kocaeli, Turkey, September, **2014**. (Available at WWW)

1) **A.F. Tabak**, A. Bozkurt, S. Yesilyurt, "Yürüyen düzlem dalgaların piezoseramikler ile implementasyonu," Proceedings of The 14th National Conference on Automatic Control (**TOK2013**), Malatya, Turkey, September, **2013**. (Available at WWW)

* Only accepted/in-print/published work included.

## International & National Academic Responsibilities

Editorial:

2020 – 2021 Frontiers in Robotics and AI, Research Topic Leading Guest Editor (Micro Robotic Sensing and Control for Minimally Invasive Medicine)

Committee Membership:

2021 – Technical Committee of Micro/Nano Robotics and Automation, IEEE Robotics and Automation Society

2020 – International Conference on Manipulation, Automation and Robotics at Small Scales (MARSS) Program Committee Member (Starting as of 09/2020)

2016 COMSOL Conference 2016 Munich, Germany, October 12-14.

- *Ad Hoc Reviewer for International Journals*:

IEEE Internet of Things Journal (IoT) (ISSN: 23274662)
Journal of Micro-Bio Robotics (JMBR) (ISSN: 2194–6418)
Small (ISSN: 1613–6810): 2018 x1 (smll.201804421)
IEEE Robotics and Automation Letters (RA-L) (ISSN: 2377–3766)
Advanced Theory and Simulations (Online ISSN: 2513–0390)
IEEE/ASME Transactions on Mechatronics (TMECH) (ISSN: 1083–4435)

Advanced Science (ISSN: 2198–3844)
Advanced Materials Interfaces (Online ISSN: 2196–7350)
Proceedings of the Royal Society of London A (RSPA) (ISSN: 1364–5021)
Journal of Nanoparticle Research (JNR) (ISSN: 1388–0764)
International Journal of Advanced Robotic Systems (IJARS) (ISSN: 1729–8814)

- *Ad Hoc Reviewer for National Journals and Conferences*:
Turkish Journal of Electrical Engineering and Computer Sciences (TJEECS) (ISSN: 1300-0632)
Istanbul Commerce University Journal of Science (ISSN: 1305-7820)

## Skills

Trainings: Clean-room training (Sabanci University, Istanbul, 2005-2006 & 2012-2014)
GMO – S1 Lab safety training (MPI for Intelligent Systems, Stuttgart, 2016-2017)
First-aid training (Deutsches Rotes Kreuz, Stuttgart, 2016)
"Masterclass für Wissenschaftskommunikation" by Malcolm Love (British Council, Berlin, 2016)

Languages: Turkish (Native),
English (Advanced – IBT TOEFL: 103/120, 2020; YÖKDİL: 93.75/100, 2021),
German (Basic –IFA A.2.1, 2017, Stuttgart)

Software: MATLAB & Simulink, COMSOL, SolidWorks, PRO/Engineer, EAGLE, Maple, CoventorWare, JMP, DynamicStudio, DSPACE ControlDesk, ESCON Studio, PSIM, Linux (openSUSE, CentOS, Xubuntu, Ubuntu Gnome, Xenomai-RTXI, RTAI), GNU Octave, FreeCAD, RoboAnalyzer, Energy2D

Equipment: Particle Image Velocimetry, Optical Tweezers, Vibrating Sample Magnetometer, Stereolithography-based Rapid Prototyping (SLA), D/A Signal acquisition (dSpace DS1102, Acquitek 16AO16 & 24DSI12, Measurement Computing 1616FS), Maxon Escon servo-controller boards.

## Teaching

Courses (Kadir Has University):
*Instructor:*

| | |
|---|---|
| Fundamentals of Electronics (CE261): | Fall 2020-2021 (106 Students)<br>Fall 2021-2022 (60 Students) |
| Fundamentals of Electronic Circuits (CME263): | Fall 2021-2022 (24 Students) |
| Mechanical Systems Design Project (MTE 264): - (*offered and coordinated for the first time in the MTE department*) | Spring 2020-2021 (3 Students) |

*Mentour:*

| | |
|---|---|
| Logic Design Project (MTE293): | Fall 2020-2021 (17 Students)<br>Fall 2021-2022 (40 Students) |

Courses (Bahcesehir University):

| | |
|---|---|
| Introduction to Micro-electro-mechanical Systems (MCH4103): | Spring 2019-2020 (21 Students) |
| Advanced Robotics (MCH5462): | Spring 2019-2020 (6 Students) |
| Mechatronics System Design (MCH4921): - (*offered and coordinated for the first time in the MCH department*) | Fall 2019-2020 (69 Students) |
| Introduction to Thermal-Fluids (MCH2015): - (*offered and coordinated for the first time in the MCH department*) | Fall 2019-2020 (122 Students) |
| Introduction to Fluid Mechanics and Heat Transfer (MCH2014): | Spring 2018-2019 (115 Students) |

| | |
|---|---|
| Introduction to Computational Fluid Dynamics (MCH4213): | Spring 2018-2019 (24 Students) |
| Engineering Materials (MCH2002): | Fall 2018-2019 (14 Students) |
| Fundamentals of Robotics (MCH4001): | Fall 2018-2019 (21 Students), Fall 2019-2020 (38 Students) |
| Transport Phenomena (MCH5461): | Fall 2018-2019 (10 Students) |

Courses (Istanbul Okan University):

| | |
|---|---|
| Introduction to Robotics (MCHT452): | Spring 2017-2018 (7 Students) |
| Introduction to Thermal Systems Engineering (MCHT332): | Spring 2017-2018 (9 Students) |

Courses (Istanbul Commerce University):

| | |
|---|---|
| Fluid Mechanics (MEE341) | Summer 2017-2018 (8 Students) |
| Thermodynamics (MCE243): | Fall 2013-2014 (18 Students) |
| Computer Programming (with MATLAB) (MTF122/JWL209): | Fall 2013-2014 (41 Students), Spring 2013-2014 (13 Students) |
| Mechatronics System Design (MCE555): | Fall 2013-2014 (3 Students) |
| Mass and Heat Transfer (MCE347): | Spring 2013-2014 (11 Students) |
| Microelectromechanical Systems (MCE642): | Spring 2013-2014 (3 Students) |
| Advanced Fluid Mechanics (MCE640): | Spring 2013-2014 (2 Students) |

Teaching Assistantships (Sabanci University):

| | |
|---|---|
| Computer Aided Engineering (ME410): | Spring 2005-2006, Spring 2006-2007, Fall 2009-2010 |
| Computational Analysis and Simulation (ME415): | Fall 2010-2011 |
| Fluid Dynamics (ME307): | Spring 2005-2006, Fall 2008-2009, Fall 2009-2010 |
| Foundations of Microsystems (ME409): | Fall 2005-2006 |
| Heat and Mass Transfer (ME309): | Fall 2005-2006, Spring 2006-2007, Spring 2008-2009, Spring 2009-2010, Spring 2010-2011, Spring 2011-2012 |
| Science of Nature (NS101): | Fall 2006-2007 |

Graduate Students (BU):

Ege Keskin, MSc Student (2018 – 2020) with thesis. MSc. Thesis Title: *Development of a yogurt fermentation model based on electrical classification*. Submitted to the Graduate School of Natural and Applied Sciences, Bahcesehir University, June **2020**.

Usman Abdulmumini Usman, MSc Student (2018 – 2020 exp.) without thesis: Submitted graduation project to Graduate School of Natural and Applied Sciences, Bahcesehir University, June **2020**, on *Chess playing robot manipulator*.

Thesis Jury Memberships:

*Synthesis of Biocompatible Swimmers with Magnetic Additives,* M.Sc. Thesis by Hayder Ayad Abd Ali Al-Shammari, Graduate School of Natural and Applied Sciences, Bahcesehir University, Istanbul, January, **2021**.

*Kinematic and Dynamic Modeling of Biomimetic Undulating Fins for Underwater Robots,* M.Sc. Thesis by Alhamzah Ihsan Ali, Graduate School of Natural and Applied Sciences, Bahcesehir University, Istanbul, January, **2021**.

*Stability, Control and Acoustic Manipulation of Magnetically Actuated Helical Swimmers,* PhD Thesis by Hakan Osman Caldag. Graduate School of Engineering and Natural Sciences, Sabanci University, Istanbul, August, **2020**.

*Desktop Microfactory*, M.Sc. Thesis by Zhenishbek Zhakypov, Graduate School of Engineering and Natural Sciences, Sabanci University, Istanbul, July, **2013**.

*Programming Environment for Path Generatıon of Manipulator Systems of FESTO AG & Co. KG and Its Implementation*, M.Sc. Thesis by Tarik Edip Kurt, Graduate School of Engineering and Natural Sciences, Sabanci University, Istanbul, July, **2013**.

Supervised Projects:

*Bahcesehir University Capstone Project(s):*

- Dodgeball robot (Spring 2020) – Students: Çağkan Esnaf, Emre Beştek
- M&M sorter (Spring 2020) – Students: Denizhan Gülenç, Christopher Rogenbuke, Numan Yeniay, Ayşe Elifsu Açıkalın,
- Tic-Tac-Toe game cube (Fall 2019) – Students: Hazar Ulusoy, Gökberk Kerem Demir, Barış Uyguner
- First-person view (FPV) (Spring 2020) – Students: Doğa Cengiz, İbrahim Burak Özkaynak,
- Gripper control with EMG signals (Spring 2020) - Students: Yalçın Can Benal, Baran Atasoy, Yamaç Sarp Hoşöz
- Autonomous white-board eraser (Spring 2020) – Students: Mert Kırkan, Mahmut Karnapoğlu, Doğan Özçelik
- Stair-climbing robot (Spring 2020) – Students: Tunay Ural, Tuna Serdar
- Rotating cylinder sailboat (Fall 2018-2019, Spring 2018-2019) – Students: Burak Osman Yüce, Onur Akyürek, Serkan Oral, Anıl Yılmaz
- Waste disposal mobile robot (Spring 2018-2019) – Students: Kaan Aslım, Gökhan Akkuş
- Autonomous robotic arm for industrial pick-and-place applications (Spring 2018-2019) – Students: Fazlı Görkem Bal, Cenk Batuhan, Duru Önver
- Smart piggy bank (Spring 2018-2019) – Students: Kayıhan Ceylan, Selim Hoşver

*Sabanci University Proj102 Project Course (as TA):*

- Design and demonstration of (electro)mechanical fish robot (Spring 2006-2007, Spring 2009-2010, Fall 2010-2011),
- Design and demonstration of a rotating cylinder sail (Spring 2009-2010, Fall 2010-2011),
- Design and implementation of a remote controlled hovercraft (Spring 2010-2011),
- Design and implementation of a remote controlled submarine (Spring 2010-2011).

*Sabanci University ENS 491/492 B.Sc. Graduation Project(s) (as TA):*

- Design and demonstration of a microswimming robot (2007-2008, 2008-2009, 2010-2011),
- Design and demonstration of a mechanical fish (2007-2008),
- Design and demonstration of microfluidic pumps and micropropulsion mechanisms (2006-2007).

## Memberships

IEEE Member (2009 – Present)
Robotics and Automation Society Member (2013 – Present)
IEEE Young Professionals (2014 – Present)
Max Planck Alumni Association e.V. Member (2018 – Present)