

## Assoc. Prof. Muhammed Fatih TOY

### Personal Information

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### International Researcher IDs

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Publons / Web Of Science ResearcherID: P-4287-2014

ScopusID: 36060541700

Yoksis Researcher ID: 231952

### Education Information

Doctorate, Ecole Polytechnique Fédérale de Lausanne, EPFL (The Federal Institute of Technology, Lausanne), Photonics, Switzerland 2008 - 2013

Postgraduate, Koc University, Fen Bilimleri Enstitüsü, Elektrik Ve Bilgisayar Mühendisliği (YI) (Tezli), Turkey 2006 - 2008

Undergraduate, Koc University, Faculty Of Engineering, Department Of Electrical And Electronics Engineering, Turkey 2001 - 2006

### Dissertations

Doctorate, 3d optical imaging of living cells in microgravity: application to study dynamic changes of cytoskeleton, Ecole Polytechnique Fédérale de Lausanne, EPFL (The Federal Institute of Technology, Lausanne), 2013

Postgraduate, Optical readout for infrared thermo-mechanical detector array, Koc University, Fen Bilimleri Enstitüsü, Elektrik Ve Bilgisayar Mühendisliği (YI) (Tezli), 2008

### Research Areas

Optical Computing, Biomedical Engineering, bioPhotonic, Biomedical Optics, Electrical and Electronics Engineering, Electronic, Optics and Photonics, MEMS, Optoelectronic Materials and Devices, Physics, Electromagnetism, Acoustics, Heat Transfer, Classical Mechanics and Fluid Dynamics, Optics, Engineering and Technology

### Academic Titles / Tasks

Associate Professor, Istanbul Medipol University, Mühendislik ve Doğa Bilimleri Fakültesi, Elektrik-Elektronik Mühendisliği Bölümü, 2023 - Continues

Assistant Professor, Istanbul Medipol University, Mühendislik ve Doğa Bilimleri Fakültesi, Biyomedikal Mühendisliği Bölümü, 2015 - 2022

Research Assistant PhD, Ecole Polytechnique Fédérale de Lausanne, EPFL (The Federal Institute of Technology, Lausanne), 2013 - 2013

Research Assistant, Ecole Polytechnique Fédérale de Lausanne, EPFL (The Federal Institute of Technology, Lausanne), 2008 - 2013

## Courses

### Postgraduate

Optics, Postgraduate, 2019 - 2020

Advanced Biomedical Optics, Postgraduate, 2019 - 2020

Fourier Optics, Postgraduate, 2018 - 2019

Biomedical Optics, Postgraduate, 2016 - 2017

### Undergraduate

Circuits 2, Undergraduate, 2022 - 2023, 2021 - 2022, 2020 - 2021, 2019 - 2020, 2018 - 2019, 2017 - 2018

Circuits 1, Undergraduate, 2022 - 2023, 2021 - 2022, 2020 - 2021, 2019 - 2020, 2018 - 2019, 2017 - 2018

Fundamentals of Photonics and Electro-Optics, Undergraduate, 2021 - 2022

Introduction to Optics, Undergraduate, 2020 - 2021, 2019 - 2020

Physics 2, Undergraduate, 2018 - 2019, 2016 - 2017, 2015 - 2016

Physics 1, Undergraduate, 2016 - 2017, 2015 - 2016

## Supervised Theses

Toy M. F., Ünlü M. B., Total internal reflection holographic microscopy for cell extension imaging, Postgraduate, T.GÜRCAN(Student), 2022

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

- I. **Visualizing hydrogen peroxide and nitric oxide dynamics in endothelial cells using multispectral imaging under controlled oxygen conditions**  
Altun H. Y., Secilmis M., Yang F., Akgul Caglar T., Vatandaşlar E., Toy M. F., Vilam S. P. L., Mann G. E., Öztürk G., Eroğlu E.  
Free Radical Biology and Medicine, vol.221, pp.89-97, 2024 (SCI-Expanded)
- II. **In-situ measurement of anisotropic Young's modulus in fused deposition modeling printed cantilevers**  
Tekin E., Çağmel M., Aydın C. O., Ferhanoğlu O., TOY M. F.  
Journal of Micromechanics and Microengineering, vol.33, no.8, 2023 (SCI-Expanded)
- III. **Scattering Metal Waveguide Based Speckle-Enhanced Prism Spectrometry**  
Cetindağ S. K., TOY M. F., Ferhanoğlu O., Civitci F.  
Journal of Lightwave Technology, vol.38, no.7, pp.2022-2027, 2020 (SCI-Expanded)
- IV. **Wedge prism assisted quantitative phase imaging on standard microscopes**  
TOY M. F.  
Optics Communications, vol.451, pp.361-366, 2019 (SCI-Expanded)
- V. **A Speckle-Enhanced Prism Spectrometer with High Dynamic Range**  
KaanÇetindağ S., TOY M. F., Ferhanoğlu O., Civitci F.  
IEEE Photonics Technology Letters, vol.30, no.24, pp.2139-2142, 2018 (SCI-Expanded)
- VI. **Marker-free phase nanoscopy**  
Cotte Y., Toy F., Jourdain P., Pavillon N., Boss D., Magistretti P., Marquet P., Depeursinge C.  
Nature Photonics, vol.7, no.2, pp.113-117, 2013 (SCI-Expanded)
- VII. **Accelerated autofocusing of off-axis holograms using critical sampling**  
Fatih Toy M. F., Kühn J., Richard S., Parent J., Egli M., Depeursinge C.  
Optics Letters, vol.37, no.24, pp.5094-5096, 2012 (SCI-Expanded)
- VIII. **Enhanced robustness digital holographic microscopy for demanding environment of space biology**  
Fatih Toy M. F., Richard S., Kühn J., Franco-Obregón A., Egli M., Depeursinge C.  
Biomedical Optics Express, vol.3, no.2, pp.313-326, 2012 (SCI-Expanded)

- IX. **Beyond the lateral resolution limit by phase imaging**  
Cotte Y., Toy M. F., Depeursinge C.  
Journal of Biomedical Optics, vol.16, no.10, 2011 (SCI-Expanded)
- X. **Realistic 3D coherent transfer function inverse filtering of complex fields**  
Cotte Y., Toy F. M., Arfire C., Kou S. S., Boss D., Bergoënd I., Depeursinge C.  
Biomedical Optics Express, vol.2, no.8, pp.2216-2230, 2011 (SCI-Expanded)
- XI. **Fourier optics analysis of grating sensors with tilt errors**  
Ferhanoglu O., Toy M. F., Urey H.  
Optics Letters, vol.36, no.12, pp.2254-2256, 2011 (SCI-Expanded)
- XII. **Digital holographic microscopy real-time monitoring of cytoarchitectural alterations during simulated microgravity**  
Pache C., Kühn J., Westphal K., Toy M. F., Parent J., Büchi O., Franco-Obregón A., Depeursinge C., Egli M.  
Journal of Biomedical Optics, vol.15, no.2, 2010 (SCI-Expanded)
- XIII. **Microscopy image resolution improvement by deconvolution of complex fields**  
Cotte Y., Toy M. F., Pavillon N., Depeursinge C.  
Optics Express, vol.18, no.19, pp.19462-19478, 2010 (SCI-Expanded)
- XIV. **Sub-Rayleigh resolution by phase imaging**  
Cotte Y., Toy M. F., Shaffer E., Pavillon N., Depeursinge C.  
Optics Letters, vol.35, no.13, pp.2176-2178, 2010 (SCI-Expanded)
- XV. **Uncooled infrared thermo-mechanical detector array: Design, fabrication and testing**  
Toy M. F., Ferhanoglu O., Torun H., Urey H.  
Sensors and Actuators, A: Physical, vol.156, no.1, pp.88-94, 2009 (SCI-Expanded)
- XVI. **Two-wavelength grating interferometry for MEMS sensors**  
Ferhanoglu O., Toy M. F., Urey H.  
IEEE Photonics Technology Letters, vol.19, no.23, pp.1895-1897, 2007 (SCI-Expanded)

## **Papers Published in Refereed Scientific Meetings**

- I. **Estimation of Two Modalities of DHM for Quantitative Measurement of Microspheres as Size Standards**  
Abaskin V., Achimova E., Prisacar A., Meshalkin A., Toy M. F.  
10th International Conference on Materials Science and Condensed Matter Physics, Chisinau, Moldova, 1 - 04 October 2024, pp.90
- II. **Polarization Sensitive Digital Holographic Imaging**  
Toy M. F.  
FOTONİK 2024 Ulusal Optik, Elektro-Optik ve Fotonik Çalıştayı, Ankara, Turkey, 13 September 2024, pp.72
- III. **An integrated top-stage incubator and lens free holographic imaging system for culture monitoring applications**  
Özbilgin Z., Aksit S., Toy M. F.  
Unconventional Optical Imaging III 2022, Virtual, Online, 9 - 20 May 2022, vol.12136
- IV. **Maskless Lithography with Holographic Feedback for the Fabrication of Optical Elements**  
Gürcan T., Toy M. F.  
3D Printed Optics and Additive Photonic Manufacturing III 2022, Virtual, Online, 9 - 20 May 2022, vol.12135
- V. **Total Internal Reflection Holographic Microscopy for Cellular Imaging**  
Gürcan T., Toy M. F.  
Unconventional Optical Imaging III 2022, Virtual, Online, 9 - 20 May 2022, vol.12136
- VI. **Total Internal Reflection Holographic Microscopy for Interfacial Imaging**  
Gürcan T., TOY M. F.  
FOTONİK 2021, 22. Ulusal Optik, Elektro-Optik ve Fotonik Çalıştayı, Online, Turkey, 10 September 2021
- VII. **Speckle-Enhanced Prism Spectrometer**

Cetindag S. K., Ferhanoğlu O., Toy M. F., Civitci F.

2019 International Conference on Optical MEMS and Nanophotonics, OMN 2019, Daejeon, South Korea, 28 July - 01 August 2019, vol.2019-July, pp.84-85

- VIII. **Refractive index tomography of myelinating glial cells**  
Toy M. F., Vatandaslar B. K., Kerman B. E.  
Quantitative Phase Imaging V 2019, California, United States Of America, 2 - 05 February 2019, vol.10887
- IX. **Quantitative Phase Imaging Upgrade on a Standard Microscope**  
TOY M. F.  
14th Nanoscience and Nanotechnology Conference, İzmir, Turkey, 22 - 25 September 2018
- X. **Optik Mikroskopide Nicel Faz Görüntülemesi**  
TOY M. F.  
FOTONİK 2018, 20. Ulusal Optik, Elektro-Optik ve Fotonik Çalıştayı, Ankara, Turkey, 14 September 2018
- XI. **Superresolution Structured Illumination Microscopy**  
ÖZGÜRÜN B., TOY M. F.  
FOTONİK 2017, 19. Ulusal Optik, Elektro-Optik ve Fotonik Çalıştayı, İstanbul, Turkey, 29 September 2017
- XII. **Super-resolution Phase Tomography**  
Depeursinge C., Cotte Y., TOY M. F., Jourdain P., Boss D., Marquet P., Magistretti P.  
Digital Holography and Three-Dimensional Imaging 2013, Hawaii, United States Of America, 21 - 25 April 2013
- XIII. **Digital holographic microscopy for the cytomorphological imaging of cells under zero gravity**  
TOY M. F., Richard S., Kühn J., Franco-Obregon A., Egli M., Depeursinge C.  
SPIE BIOS 2012, Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XIX, San-Francisco, Costa Rica, 21 - 26 January 2012
- XIV. **Deconvolved phase imaging for diffraction tomography**  
Cotte Y., TOY M. F., Boss D., Depeursinge C.  
Frontiers in Optics 2011, San-Jose, Costa Rica, 16 - 20 October 2011
- XV. **Real Time 3D Cytomorphological Imaging using Digital Holographic Microscopy and Fluorescence Microscopy for Space Biology**  
TOY M. F., Kühn J., Parent J., Pache C., Egli M., Depeursinge C.  
Digital Holography and Three-Dimensional Imaging 2010, Miami, United States Of America, 12 - 14 April 2010
- XVI. **Studies on Synthetic Deconvolution of Complex Fields with Digital Holographic Microscopy**  
Cotte Y., TOY M. F., Pavillon N., Depeursinge C.  
Focus on Microscopy 2010, Şangay, China, 28 - 31 March 2010
- XVII. **Dual-mode digital holographic and fluorescence microscopy for the study of morphological changes in cells under simulated microgravity**  
TOY M. F., Pache C., Parent J., Kühn J., Egli M., Depeursinge C.  
SPIE BIOS 2010, Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XVII, San-Francisco, Costa Rica, 23 - 28 January 2010
- XVIII. **Parylene-based uncooled thermomechanical array**  
FERHANOĞLU O., TOY M. F., ÜREY H.  
SPIE Defense, Security, and Sensing, 2009, Infrared Technology and Applications XXXV, Orlando, United States Of America, 13 - 17 April 2009
- XIX. **MOEMS thermal imaging camera**  
TOY M. F., FERHANOĞLU O., TORUN H., Degertekin L., ÜREY H.  
2008 Ph.D. Research in Microelectronics and Electronics, İstanbul, Turkey, 22 - 25 June 2008
- XX. **Thermal-mechanical Detector Array with Integrated Diffraction Grating**  
FERHANOĞLU O., TOY M. F., Ünal G., Kalyoncu H., Kabuli G., Caliskan A. U., ÜREY H.  
LEOS 2007 - IEEE Lasers and Electro-Optics Society Annual Meeting, Lake Buena Vista, United States Of America, 21 - 25 October 2007
- XXI. **Two-wavelength Grating Interferometry for Extended Range MEMS Metrology**  
TOY M. F., FERHANOĞLU O., ÜREY H.  
2007 IEEE/LEOS International Conference on Optical MEMS and Nanophotonics, Hualian, Taiwan, 12 - 16 August

## Supported Projects

Toy M. F., TÜBİTAK International Bilateral Joint Cooperation Program Project, Boosting the scientific and innovative capacity of bilateral consortium to advance the polarization-sensitive DHM with singular structured illumination for biomedical applications, 2024 - 2026

Toy M. F., TÜBA Project, Yüksek Çözünürlüklü Tüm İç Yansıma Holografik ve Floresan Mikroskop Geliştirme ve Hücrel Arayüzlerin İncelenmesinde Kullanımı, 2022 - 2024

Toy M. F., TÜBİTAK Project, Yüksek Çözünürlüklü Tüm İç Yansıma Holografik Mikroskop Geliştirme Ve Hücrel Arayüzlerin İncelenmesinde Kullanımı, 2020 - 2023

Kerman B. E., Toy M. F., TÜBİTAK Project, Beyinde Demiyelinizasyon Tespit Yönteminin Geliştirilmesi, 2020 - 2021

Toy M. F., Kerman B. E., TÜBİTAK Project, Çift Modlu Ve Çok Dalgaboylu 3 Boyutlu Nicel Faz Ve Florasans Mikroskopisi, 2017 - 2020

Toy M. F., TÜBİTAK Project, Geniş Serbest Spektral Alana Sahip Yüksek Çözünürlüklü Optik Spektrometre, 2017 - 2019

Güntürk B. K., Toy M. F., Project Supported by Other Official Institutions, Yenilikçi Mikroskop Teknolojileri Merkezi Projesi, 2016 - 2017

Toy M. F., TÜBİTAK Project, Holografik Mikro Fabrika: 3 Boyutlu Mikro Optik Eleman ve Biyolojik Yapı Iskeleti Yazıcısı, 2015 - 2017

## Patent

Toy M. F., Gürcan T., A photolithography method and system, Patent, CHAPTER G Physics, The Invention Registration Number: TR2022/003354 , Standard Registration, 2023

Muhammed Fatih T., High resolution prism spectrometer comprising a diffuser film, Patent, CHAPTER G Physics, 2022

## Metrics

Publication: 39

Citation (Scopus): 808

H-Index (Scopus): 12

## Awards

Toy M. F., TÜBA Gebip Ödülü, Türkiye Bilimler Akademisi, December 2021

Toy M. F., Ten Outstanding Young Persons Türkiye, Junior Chamber International Türkiye , June 2017