

PERSONAL
INFORMATION

TRANCĂ Denis-Emanuil

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 denis_emanuil.tranca@upb.ro

Sex M | Date of birth 07/01/1987 | Nationality Romanian



RESEARCH INTERESSETS

Scanning Probe Microscopy; Laser Scanning Microscopy; Digital Holographic Microscopy; Structured Illumination Microscopy; Optics; Photonics; Image Processing Algorithms; Applied Physics.

WORK EXPERIENCE

October 2016 – present

Physics Lecturer

University POLITEHNICA of Bucharest (Romania)

Faculty of Applied Sciences, Physics Department

November 2011 – present

Research Engineer in Applied Physics

Center for Microscopy-Microanalysis and Information Processing (CMMIP) – University POLITEHNICA of Bucharest (Romania) – www.cmmip-upb.org

Sector High resolution scanning optical microscopy (laser and probe)

April – May 2015

Research Fellow

3D Imaging and Laboratory, Department of Optics, University of Valencia, Spain

<http://www.uv.es/imaging3>

April – July 2010

Research Fellow

Laboratoire Matériaux Optiques, Photonique et Systèmes – SUPÉLEC University, Metz (France)

<http://lmops.univ-lorraine.fr>

EDUCATION AND
TRAINING

Dates

2012 – 2015

Title of qualification
awarded

Doctor in *Electronics Engineering*

Title of thesis

New Techniques for High-Resolution Optical Microscopy

Defense committee

Prof. Genaro Saavedra (University of Valencia); Dr. Joanna Bauer (Wroclaw University of Technology); Prof. Paul Schiopu (University Politehnica of Bucharest)

Name and type of the
organization providing
education

Doctoral School of Electronics, Telecommunications and Information Technology,
University POLITEHNICA of Bucharest

PERSONAL SKILLS AND AWARDS

Dates
Title of qualification
awarded
Principal Subject
Name and type of the
organization providing
education

2010 – 2012

Master's degree in *Electronics Engineering*

Optoelectronics

Faculty of Electronics, Telecommunications and Information Technology,
University POLITEHNICA of Bucharest

Dates
Title of qualification
awarded
Principal Subject
Name and type of the
organization providing
education

2006 – 2010

Engineer in *Electronics and Telecommunications*

Optoelectronics

Faculty of Electronics, Telecommunications and Information Technology,
University POLITEHNICA of Bucharest

Dates
Name and type of the
organization providing
education
Section

2002 – 2006

Colegiul Național "Frații Buzești" High School

Mathematics and Informatics

Job-related skills

- Technical and practical skills in laser-scanning and probe-scanning optical microscopy areas, skills developed at CMMIP, University Politehnica of Bucharest.
- Technical and practical skills in Digital Holographic Microscopy and Structured Illumination Microscopy; practical skills to build optical microscopes and complex optical setups on table, skills developed at 3D Imaging and Laboratory, Department of Optics, University of Valencia, Spain.
- Working with lasers, optical fibers and video systems, skills developed during the four months research stage at the LMOPS Laboratory, SUPELEC University, France.
- *Best Paper Award*, International Semiconductor Conference, Sinaia, 2011.
- *Certificate of Merit for Performances in Physics*, Craiova University, 2006.
- *Certificate of professional skills*, for medium-level programming, 2006.

Awards

PARTICIPATION IN NATIONAL AND INTERNATIONAL RESEARCH PROJECTS

PROJECT	DURATION	FUNCTION
COST/ ACTION MP0702 TOWARDS FUNCTIONAL SUB-WAVELENGTH PHOTONIC STRUCTURES	2008-2012	Participant (Target group young researcher)
BILATERAL SCIENTIFIC COOPERATION PROJECT: ROMANIA-SLOVAKIA	2011-2012	Participant
EU-CORDIS-FP7/ REAL TIME LABEL FREE NANOSCOPY USING INFRA RED ABSORPTION (LANIR)	2012-2015	Participant
PN-II-PT-PCCA New methods and investigations protocols for the early diagnosis, efficient screening, prognostic and therapy of non-melanoma skin cancers based on existing and novel micro & nano optical tools	2012-2016	Participant
POSDRU/159/1.5/S/137390/Doctoral research fellowship: New high-resolution optical microscopy techniques	2014-2015	Participant
PN-II-RU-TE Correlation and integration of microscopy and nanoscopy data by advanced computer vision methods (MICRONANO)	2015-2017	Participant

PN-III-P2-2.1-PED-2016-0450 Quantitative Nanoscopy for Biological Tissue Characterization (Q-NANOBIOTIC)	2017-2018	Coordinator
PN-III-P2-2.1-PED-2016: An Experimental Machine Intelligence Framework for the Automated Differentiation of Healthy, Dysplastic and Malignant Tissues Based on Multiphoton Microscopy Datasets (MICAND)	2017-2018	Participant
PN-III-P1-1.1-TE-2016-2147: Correlative optical imaging in the far-field and near-field regimes: technical developments and applications (CORIMAG)	2018-2020	Participant
PN-III-P1-1.1-TE-2016-1756: Label-free quantitative microscopy based on second harmonic generation at nanoscale (NANOSHG)	2018-2020	Participant
PN-III-P1-1.1-TE-2016-2147: Novel Optical Imaging Approaches for the In-depth Understanding of Advanced Nanostructured Materials and their Interaction with Biological Species (NANOMATBIOIMAGE)	2018-2019	Participant

LOCAL RESEARCH PROJECTS

PROJECT	DURATION	FUNCTION
GEX 2017 - Near-field 3D Imaging (<i>financed by University Politehnica of Bucharest</i>)	2017-2018	Coordinator

LIST OF PUBLICATIONS

Journal Articles

2020

1. **Tranca, D.E.**, Stanciu, S.G., Hristu, R., Latterini, L. and Stanciu, G.A., 2020. Surface optical characterization at nanoscale using phasor representation of data acquired by scattering scanning near-field optical microscopy. *Applied Surface Science*, p.145347.
2. Stanciu, S.G., **Tranca, D.E.**, Pastorino, L., Boi, S., Song, Y.M., Yoo, Y.J., Ishii, S., Hristu, R., Yang, F., Bussetti, G. and Stanciu, G.A., 2020. Characterization of Nanomaterials by Locally Determining their Complex Permittivity with Scattering-Type Scanning Near Field Optical Microscopy. *ACS Applied Nano Materials*.

2019

3. Liang, Y., Wang, P., Wang, Y., Dai, Y., Hu, Z., **Tranca, D.E.**, Hristu, R., Stanciu, S.G., Toma, A., Stanciu, G.A. and Wang, X., 2019. Growth Mechanisms and the Effects of Deposition Parameters on the Structure and Properties of High Entropy Film by Magnetron Sputtering. *Materials*, 12(18), p.3008.

2018

4. **Tranca, D. E.**, Stanciu, S. G., Hristu, R., Witgen, B. M., & Stanciu, G. A. (2018). Nanoscale mapping of refractive index by using scattering-type Scanning Near-Field Optical Microscopy. *Nanomedicine: Nanotechnology, Biology and Medicine*, 14(1), 47-50.

2017

1. Hristu, R., Stanciu, S. G., **Tranca, D. E.**, Polychroniadis, E. K., & Stanciu, G. A., 2017. Identification of stacking faults in silicon carbide by polarization-resolved second harmonic generation microscopy.

Scientific Reports, 7.

2. Stanciu, S. G., **Tranca, D. E.**, Hristu, R., & Stanciu, G. A. (2017). Correlative imaging of biological tissues with apertureless scanning near-field optical microscopy and confocal laser scanning microscopy. *Biomedical optics express*, 8(12), 5374-5383.
3. Hristu, R., Stanciu, S. G., **Tranca, D. E.**, & Stanciu, G. A. (2017). Improved quantification of collagen anisotropy with polarization-resolved second harmonic generation microscopy. *Journal of biophotonics*, 10(9), 1171-1179.

2016

4. Stanciu, S.G., Costache, M., **Tranca, D.E.**, Hristu, R., Popescu, M., Enache, V. and Stanciu, G.A., 2016. Towards imaging skin cancer by apertureless scanning near-field microscopy. *UPB Scientific Bulletin Series A*, 78(2), pp. 235-244.
5. Stanciu, S.G., **Tranca, D.E.**, Stanciu, G.A., Hristu, R. and Bueno, J.M., 2016. Perspectives on combining Nonlinear Laser Scanning Microscopy and Bag-of-Features data classification strategies for automated disease diagnostics. *Optical and Quantum Electronics*, 48(6), pp.1-13.
6. Dragoi, I.C., Stanciu, S.G., Hristu, R., Coanda, H.G., **Tranca, D.E.**, Popescu, M. and Coltuc, D., 2016. Embedding complementary imaging data in laser scanning microscopy micrographs by reversible watermarking. *Biomedical Optics Express*, 7(4), pp.1127-1137.
7. **Tranca, D.E.**, Sánchez-Ortiga, E., Saavedra, G., Martínez-Corral, M., Tofail, S.A., Stanciu, S.G., Hristu, R. and Stanciu, G.A., 2016. Mapping electron-beam-injected trapped charge with scattering scanning near-field optical microscopy. *Optics letters*, 41(5), pp.1046-1049.
8. **Tranca, D. E.**, Stanciu, S. G., Hristu, R., Stoichita, C., Tofail, S. A. M., and Stanciu, G. A., 2016. Nanoscale mapping of dielectric function by scattering scanning near-field optical microscopy. *Imaging and Microscopy*, 18(1), 40-42.

2015

9. Stanciu, S.G., **Tranca, D.E.** and Coltuc, D., 2015. Contrast enhancement influences the detection of gradient based local invariant features and the matching of their descriptors. *Journal of Visual Communication and Image Representation*, 32, pp.246-256.
10. Matei, A.A., Pencea, I., Branzei, M., **Tranca, D.E.**, Țepeș, G., Sfăt, C.E., Ciovica, E., Gherghilescu, A.I. and Stanciu, G.A., 2015. Corrosion resistance appraisal of TiN, TiCN and TiAlN coatings deposited by CAE-PVD method on WC-Co cutting tools exposed to artificial sea water. *Applied Surface Science*, 358, pp.572-578.
11. **Tranca, D.E.**, Stanciu, S.G., Hristu, R., Stoichita, C., Tofail, S.A.M. and Stanciu, G.A., 2015. High-resolution quantitative determination of dielectric function by using scattering scanning near-field optical microscopy. *Scientific reports*, 5.
12. Hristu, R., Stanciu, S.G., **Tranca, D.E.** and Stanciu, G.A., 2015. Electron beam influence on the carbon contamination of electron irradiated hydroxyapatite thin films. *Applied Surface Science*, 346, pp.342-347.
13. **Tranca, D.E.**, Stanciu, G.A., 2015. New approaches for high-resolution optical microscopy. *Proceedings of Doctoral Consortium PHOTOPTICS 2015 (Available on Scitepress Digital Library)*, pp.19-25.

2014

14. Hristu, R., Stanciu, S.G., **Tranca, D.E.**, Matei, A. and Stanciu, G.A., 2014. Nonlinear optical imaging of defects in cubic silicon carbide epilayers. *Scientific reports*, 4.

15. Hristu, R., **Tranca, D.E.**, Stanciu, S.G., Gregor, M., Plecenik, T., Truchly, M., Roch, T., Tofail, S.A. and Stanciu, G.A., 2014. Surface Charge and Carbon Contamination on an Electron-Beam-Irradiated Hydroxyapatite Thin Film Investigated by Photoluminescence and Phase Imaging in Atomic Force Microscopy. *Microscopy and Microanalysis*, 20(2), p.586.
16. **Tranca, D.E.**, Stoichita, C., Hristu, R., Stanciu, S.G. and Stanciu, G.A., 2014. A study on the image contrast of pseudo-heterodyned scattering scanning near-field optical microscopy. *Optics express*, 22(2), pp.1687-1696.

2013

17. Stanciu, S.G., Coltuc, D., **Tranca, D.E.** and Stanciu, G.A., 2013. Matching DSIFT Descriptors Extracted from CSLM Images. *Engineering*, 5(10), p.199.

2012

18. **Tranca, D.E.**, Tomescu, R. and Schiopu, P., 2012. Design and simulation of infrared optical logic gates based on Si photonic crystal waveguides for high density photonic integrated circuits. In *Advanced Topics in Optoelectronics, Microelectronics, and Nanotechnologies 2012*, pp. 84110Q-84110Q.

2011

19. Wolfersberger, D. and **Tranca, D.**, 2011. 2D infrared self-focusing in bulk photorefractive SBN. *Optical Materials Express*, 1(7), pp.1178-1184.

Conferences

1. Nonlinear effects in scanning laser microscopy used to investigate silicon carbide polytypes, G.A.Stanciu, R. Hristu, S.G. Stanciu, **D.E. Tranca**, E.K. Polychroniadis, *Focus on Microscopy*, 2012, Singapore;
2. Enhancing local feature matching between CSLM images by histogram modeling, S.G. Stanciu, D.Coltuc, R. Hristu, **D. Tranca**, G.A. Stanciu, *Focus on Microscopy*, 2012, Singapore;
3. Metallic samples investigated by using a scattering near field optical microscope, G.A. Stanciu, C.Stoichita, R. Hristu, S.G. Stanciu, **D.E. Tranca**, *International Conference on Transparent Optical Networks 2012*, Warwick, England (invited lecture);
4. Scattering near-field optical microscopy for gold nano-particles investigations, **Denis E. Tranca**, Radu Hristu, Stefan G. Stanciu and George A. Stanciu, 2012 *Workshop on Super-resolution and Life Sciences*, 3-6 October 2012, Brasov, Romania;
5. Optical and morphological characterization of electron beam created surface potential micro domains on hydroxyapatite coatings, Radu Hristu, Stefan G. Stanciu, **Denis E. Tranca**, George A. Stanciu, *Workshop on Super-resolution and Life Sciences*, 3-6 October 2012, Brasov, Romania;
6. Investigations on skin cancers by nonlinear optical microscopy, S.G. Stanciu, M. Popescu, R. Hristu, V. Enache, **D.E. Tranca** & G.A. Stanciu, *Focus on Microscopy*, 2013, Maastricht, The Netherlands;
7. Investigations at nanoscale by using fluorescence in apertureless scanning near field microscopy, G.A. Stanciu, **D.E. Tranca**, R. Hristu, C. Stoichita, S.G. Stanciu, *15th International Conference on Transparent Optical Networks 2013*, Cartagena, Spain, (invited lecture);

8. Combined microscopy techniques boost biomedical imaging of ocular tissues, J.M. Bueno, **D. Tranca**, F.J. Valiente-Soriano, M. Aviles-Trigueros, S.G. Stanciu & G.A. Stanciu, *Focus On Microscopy*, 2014, Sydney, Australia;
9. Hydroxyapatite surface charge investigated by scanning probe microscopy, R. Hristu, S.A.M. Tofail, S.G. Stanciu, **D.E. Tranca**, and G.A. Stanciu, *16th International Conference on Transparent Optical Networks*, 6-10 July 2014, Graz, Austria (invited lecture);
10. Investigations on Organic Fluorophore Doped Silica Nanoparticles by Apertureless Scanning Near Field Optical Microscopy, S.G. Stanciu, **D.E. Tranca**, L. Tarpani, G.A. Stanciu, R. Hristu and L.Latterini, *16th International Conference on Transparent Optical Networks*, 2014, Graz, Austria (invited lecture);
11. Scattering scanning near field optical microscopy used for nanoscale investigations, G.A.Stanciu, **D.E. Tranca**, R. Hristu, C. Stoichita and S.G. Stanciu, *International Conferences on Laser Applications in Life Sciences (LALS)*, 29th June – 2nd July, 2014, Ulm, Germany (invited lecture);
12. Investigations on image contrast in pseudo-heterodyne scattering scanning near-field optical microscopy, **D.E. Tranca**, S.G. Stanciu, C. Stoichita, R. Hristu, S.A.M. Tofail & G.A. Stanciu, *Focus on Microscopy* 2015, Gottingen, Germany;
13. Interrelationship between electron-beam-induced surface charge and carbon contamination on hydroxyapatite, R. Hristu, S.G. Stanciu, **D.E. Tranca** & G.A. Stanciu, *Focus on Microscopy*, 2015, Gottingen, Germany;
14. A Platform for Micro- and Nanoscale Optical Imaging Using Complementary Contrast Mechanisms, S.G. Stanciu, C. Stoichita, R. Hristu, **D.E. Tranca** and G.A. Stanciu, *15th annual meeting of the European Light Microscopy Initiative (ELMI)*, 2015, Sitges, Spain;
15. Combined Multimodal Imaging at Micro- and Nanoscale Using Complementary Contrast Mechanisms, S.G. Stanciu, C. Stoichita, R. Hristu, **D.E. Tranca** and G.A. Stanciu, *EuroNanoForum* 2015, Riga, Latvia;
16. Bags-of-Features for classification of Laser Scanning Microscopy Data, S.G. Stanciu, R.Hristu, **D.E. Tranca**, G.A. Stanciu, *IEEE International Conference on Transparent Optical Networks* 2015, Budapest, Hungary (invited lecture);
17. On Packing Laser Scanning Microscopy Images by Reversible Watermarking: a Case Study, C. Dragoi, S.G. Stanciu, D. Coltuc, **D.E. Tranca**, R. Hristu and G.A. Stanciu, *23rd IEEE European Signal Processing Conference (EUSIPCO)*, 2015, Nice, France;
18. Combining Multiphoton Laser Scanning Microscopy and Bag-of-Features Image Classification for Automated Disease Diagnosis, S.G. Stanciu, R. Hristu, **D.E. Tranca**, G.A. Stanciu, J.M. Bueno, *International Conference on Advanced Laser Technologies (ALT 15)*, 2015, Faro, Portugal (invited lecture);
19. Automatic Moiré Pattern Removal in Microscopic Images, G.M. Ionita, D. Coltuc, S.G. Stanciu, **D.E. Tranca**, *19th International Conference on System Theory, Control and Computing (ICSTCC)*, 2015, Cheile Gradistei-Fundata, Romania;
20. Ocular Tissues Investigated by Using Scattering Scanning near-Field Optical Microscopy and Atomic Force Microscopy, J.M. Bueno, S.G. Stanciu, **D.E. Tranca**, F.J. Avila, M. Aviles-trigueros, G.A. Stanciu, *Focus on Microscopy*, 2016, Taipei, Taiwan.
21. Surface Imaging of Biological Cells by Using Scattering Scanning Near-Field Optical Microscopy, **D.E. Tranca**, S.G. Stanciu, R. Hristu, and G.A. Stanciu, *12th International Congress of Cell Biology*, 2016, Prague, Czech.

22. Nonlinear optical microscopy for investigation of gastrointestinal lesions, T. Genova, E. Borisova., G. Stanciu, D. Tranca, I. Terziev, N. Penkov, B. Vladimirov, M. Lomova, O. Semyachkina-Glushkovskaya and L. Avramov, *International Conference and School on Quantum Electronics*, 2016, Sozopol, Bulgaria.
23. Nonlinear optical microscopy for investigation of gastrointestinal lesions., Genova, T., Borisova, E., Stanciu, G., **Tranca, D.**, Terziev, I., Penkov, N., ... & Avramov, L, In *International Conference and School on Quantum Electronics* (pp. 1022617-1022617), 2017.
24. Fractal analysis correlation of the images from scanning laser microscopy techniques and atomic force microscopy, A. Toma, **D.E. Tranca**, C.V. Sammut, and G.A. Stanciu, *IEEE International Conference on Transparent Optical Networks* 2017, Girona, Spain (invited lecture).
25. Changes in the collagen structure of thyroid nodule capsules determined by polarization-resolved second harmonic generation microscopy., Hristu, R., Paun, B., Eftimie, L., Stanciu, S.G., Tranca, D.E. and Stanciu, G.A., 2018, July. In 2018 20th International Conference on Transparent Optical Networks (ICTON) (pp. 1-4). IEEE.
26. Nanoscale Investigations of Optical Fiber by Using Scattering Scanning Near-Field Optical Microscopy, Tranca, D.E., Stoichita, C., Hristu, R., Stanciu, S.G., Sammut, C.V. and Stanciu, G.A., 2018, July. In 2018 20th International Conference on Transparent Optical Networks (ICTON) (pp. 1-3). IEEE.
27. Imaging Biological Specimens and Advanced Materials with Correlative Far-field Near-field Microscopy. Stanciu, S.G., Tranca, D.E., Stoichita, C., Hristu, R. and Stanciu, G.A., 2018, July. In 2018 Conference on Lasers and Electro-Optics Pacific Rim (CLEO-PR) (pp. 1-2). IEEE.
28. Advances in Fractal Analysis of the Biological Tissues Images Obtained by Using Laser Scanning Microscopy. Toma, A., Hristu, R., Capraru, T., Stanciu, S.G., Tranca, D. and Stanciu, G.A., 2019, July. In 2019 21st International Conference on Transparent Optical Networks (ICTON) (pp. 1-4). IEEE.
29. Correlative Imaging Using a Multimodal Microscopy System for Investigations at Micro and Nano Scales. Stanciu, G.A., Tranca, D.E., Stanciu, S.G., Hristu, R., Stoichita, C. and Bueno, J.M., 2019, July. In 2019 21st International Conference on Transparent Optical Networks (ICTON) (pp. 1-4). IEEE.
30. Quantitative imaging of advanced nanostructured materials with scattering-type scanning near field optical microscopy. Stanciu, S.G., Tranca, D.E., Pastorino, L., Boi, S., Song, Y.M., Yoo, Y.J., Ishii, S., Yang, F., Wu, A., Hristu, R. and Stanciu, G.A., 2019, October. In Fourth International Conference on Applications of Optics and Photonics (Vol. 11207, p. 112071K). International Society for Optics and Photonics.