

Özlem Şardan Sukas

April 8, 1982

University of Twente, Faculty of Science & Technology, Carré 3213

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EDUCATION

PhD in Electronics & Communication **03/2010**

Technical University of Denmark (DTU), Kgs. Lyngby, Denmark

Thesis: "Topology Optimized Microgrippers for Nanomanipulation and Assembly" funded by EU project NANOHAND (IP034274)

MSc in Mechanical Engineering **09/2006**

Koç University (KU), Istanbul, Turkey

Thesis: "Design and Fabrication of Electrostatically Actuated Nanotweezers by Guided Self-assembly"

Degree of Graduation (GPA): 4.00/4.00

BSc in Mechanical Engineering **06/2004**

Middle East Technical University (METU), Ankara, Turkey

Minor: Mechatronics

Degree of Graduation (GPA): 3.39/4.00

GRANTS

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|--|-------------------|
| <input type="checkbox"/> Graduate Fellowship, TUBITAK | 2005 |
| <input type="checkbox"/> Full Graduate Scholarship, Koç University | 09/2004 - 09/2006 |

RESEARCH INTERESTS

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- Micro- & Nano- Electro Mechanical Systems (MEMS & NEMS), Micro- & Nanofabrication
 - Robotic micro- & nanomanipulation, Magnetic manipulation
 - Micro- & Nanogrippers, Piezoelectric, Thermal & Electrostatic Actuators
 - Focused Ion Beam (FIB) Milling, Carbon Nanotubes (CNTs), Nanowires, Guided Self Assembly

TEACHING INTERESTS

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- Microelectromechanical systems
 - Micro- & Nanofabrication
 - Electro- & Magnetostatics
 - Materials Engineering
 - Statics, Strength of Materials & Theory of Machines

RESEARCH EXPERIENCE

Postdoctoral Researcher **03/2014 – Present**

Inorganic Materials Science (IMS) Group, University of Twente (UT), Enschede, The Netherlands

Main Topic: "PiezoMEMS for biosensing applications"

Postdoctoral Researcher **11/2009 - 11/2013**

Transducers Science & Technology (TST) Group, University of Twente (UT), Enschede, The Netherlands

Main Topic: "Pulsed laser deposited (PLD) PZT micro-nanostructures" within the SmartPie project funded by the SmartMix programme (SSM06016)

Secondary Topic: "Medical microrobotics" in collaboration with the Robotics & Mechatronics (RAM) Group

TEACHING EXPERIENCE

Lecturer

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| <input type="checkbox"/> "EM(Electro-Magneto)statics" course with Leon Abelmann & Hans Groenland, UT | Fall 2011 |
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Teaching/Lab Assistant

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| <input type="checkbox"/> "EM(Electro-Magneto)statics" course by Leon Abelmann & Hans Groenland, UT | Fall 2010 |
| <input type="checkbox"/> "Mech202 - Materials Engineering" course by B. Erdem Alaca, KU | Spring 2005 |
| <input type="checkbox"/> "Phys101 – General Physics I" course by Adnan Kurt, KU | Fall 2004 |

Student Assistant

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|---|-------------|
| <input type="checkbox"/> "Me205 - Statics" course by Erman Tekkaya, METU | Spring 2004 |
| <input type="checkbox"/> "Simulation of Mechanisms using MS Excel" with Eres Söylemez, METU | Spring 2003 |

ACADEMIC EXPERIENCE

Supervisor

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| <input type="checkbox"/> Special course on "Primer on Scripting Topology Optimization with Comsol", DTU | Spring 2009 |
| <input type="checkbox"/> MSc project on "Topology Optimization of Nanogrippers", DTU | 2008 |
| <input type="checkbox"/> 3-week project on "Fabrication & Characterization of Microgrippers", DTU | 06/2007 |
| <input type="checkbox"/> 3-week project on "Finite Element Simulation of Polysilicon Microgrippers", DTU | 01/2006 |

Co-supervisor

PhD project on "Mechanical properties of PLD PZT thin films", UT	2010-2012
MSc project on "Self-propelling microrobots", UT	2011-2012
MSc project on "Focused Ion Beam Fabrication of Germanium Nanodevices", DTU	2008-2009
"Fagpakke" project on "Microgrippers"	Fall 2006
BSc project on "Mix & Match of Electrothermally Actuated Nanogrippers", DTU	Spring 2006

PROFESSIONAL EXPERIENCE

MEMS Engineer 11/2012 – 11/2013

SmartTip BV, Enschede, The Netherlands

R&D of atomic force microscopy (AFM) probes for specific applications

Guest Researcher 10 – 11/2008

EMPA, Material Science and Technology, Thun, Switzerland

Temperature measurements on topology optimized microgrippers using Raman spectroscopy

Internship 07 – 09/2003

Procter & Gamble, Consumption Goods Industry, Gebze, Izmit, Turkey

Design of a new mechanical workshop for the production department by taking full responsibility

Summer Practice Summer 2002

Aselsan Military Electronics Inc., Ankara, Turkey

Active work in the machine shop, learning & performing job shop & CNC manufacturing processes

PUBLICATIONS

Journal Publications

- A Lei, D H Petersen, T J Booth, L V Homann, C Kallesoe, **O S Sukas**, Y Gyrsting, K Molhave & P Boggild, "Customizable in situ TEM devices fabricated in freestanding membranes by focused ion beam milling", *Nanotechnology*, Vol.21 (40), 405304 (2010).
- A Cagliani, R Wierzbicki, L Occhipinti, D H Petersen, K N Dyvelkov, **Ö Sardan Sukas**, B G Herstrøm, T Booth & P Bøggild, "Manipulation and in situ transmission electron microscope characterization of sub-100 nm nanostructures using a microfabricated nanogripper", *Journal of Micromechanics and Microengineering*, Vol. 20 (3), 035009 (2010).
- R T Rajendra Kumar, S U Hassan, **O Sardan Sukas**, V Eichhorn, F Krohs, S Fatikow & P Boggild, "Nanobits: Customizable scanning probe tips", *Nanotechnology*, Vol. 20 (39), 395703 (2009).
- K N Andersen, D H Petersen, K Carlson, K Mølhave, **O Sardan**, A Horsewell, V Eichhorn, S Fatikow & P Bøggild, "Multimodal electrothermal silicon microgrippers for nanotube manipulation", *IEEE Transactions on Nanotechnology*, Vol. 8 (1), pp. 76-85 (2009).
- **O Sardan**, V Eichhorn, D H Petersen, S Fatikow, O Sigmund & P Bøggild, "Rapid prototyping of nanotube-based devices using topology-optimized microgrippers", *Featured Article, Nanotechnology*, Vol. 19 (49), 495503 (2008).
- **O Sardan**, D H Petersen, K Mølhave, O Sigmund & P Bøggild, "Topology optimized electrothermal polysilicon microgrippers", *Microelectronic Engineering*, Vol. 85 (5-6), pp.1096-1099 (2008).
- **O Sardan**, B Erdem Alaca, A D Yalcinkaya, P Bøggild, P T Tang & O Hansen, "Microgrippers: A case study for batch-compatible integration of MEMS with nanostructures", *Nanotechnology*, Vol. 18 (37), 375501 (2007).
- **O Sardan**, A D Yalcinkaya & B E Alaca, "Self-assembly-based batch fabrication of nickel-iron nanowires by electroplating", *Nanotechnology*, Vol. 17 (9), pp.2227-2233 (2006).

Conference Proceedings

- Islam S M Khalil, Marc P Pichel, Bart A Reefman, **Ozlem S Sukas**, Leon Abelmann & Sarthak Misra, "Control of Magnetotactic Bacterium in a Micro-fabricated Maze", *Proceedings of ICRA 2013, IEEE International Conference on Robotics & Automation, Karlsruhe, Germany, May 6-10, 2013* (2013).
- Islam S M Khalil, Frank van den Brink, **Ozlem Sardan Sukas**, Leon Abelmann & Sarthak Misra, "Motion Control of a Cluster of Paramagnetic Microparticles: Microassembly Application", *Proceedings of ICRA 2013, IEEE International Conference on Robotics & Automation, Karlsruhe, Germany, May 6-10, 2013* (2013).
- **O Sardan Sukas**, H Yagubizade, J W Berenschot, M J de Boer, M D Nguyen & L Abelmann, "Characterization of piezoelectrically actuated PLD Pb(Zr,Ti)O₃ thin film membranes", *Proceedings of MME 2012, 23rd Micromechanics and Micro systems Europe Workshop, Ilmenau, Germany, September 9-12, 2012* (2012).
- **O Sardan Sukas**, J W Berenschot, M J de Boer, M D Nguyen, M van Zalk & L Abelmann, "Towards In-Situ TEM Analysis of PLD Pb(Zr,Ti)O₃ Thin Film Membranes", *Proceedings of MME 2011, 22nd Micromechanics and Micro systems Europe Workshop, Tønsberg, Norway, June 19-22, 2011* (2011).
- V Eichhorn, S Fatikow, **O Sardan Sukas**, T M Hansen, P Bøggild & L G Occhipinti, "Novel four-point-probe design and nanorobotic dual endeffector strategy for electrical characterization of as-grown SWCNT bundles", *Proceedings of ICRA 2010, IEEE International Conference on Robotics & Automation, Anchorage, Alaska, May 3-8, 2010*, pp. 4100-4105 (2010).

- ❑ **O S Sukas**, J Liu & P Bøggild, "Measuring the temperature of topology optimized electrothermal microgrippers using Raman spectroscopy", *Proceedings of IMECE 2009, ASME International Mechanical Engineering Congress and Exposition, Lake Buena Vista, FL, USA, November 13-19, 2009*, Vol. 12, Part A, pp. 101-104 (2009).
- ❑ V Eichhorn, S Fatikow, T Wortmann, C Stolle, C Edeler, D Jasper, **O Sardan**, P Bøggild, G Boetsch, C Canales & R Clavel, "NanoLab: A nanorobotic system for automated pick-and-place handling and characterization of CNTs", *Proceedings of ICRA 2009, IEEE International Conference on Robotics & Automation, Kobe, Japan, May 12-17, 2009*, pp. 1826-1831 (2009).
- ❑ **O Sardan**, S Fatikow, V Eichhorn, O Sigmund, D H Petersen & P Bøggild, "Topology optimized microgrippers for manipulation of carbon nanotubes", *Proceedings of IDETC 2008, ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference, New York City, NY, USA, August 3-6, 2008*, Vol. 4, pp. 799-801 (2008).
- ❑ **O Sardan**, O Sigmund, K N Andersen, P Bøggild A N Macdonald & A Horsewell, "Focused ion beam (FIB) modification of topology optimized polysilicon microgrippers", *Proceedings of IDETC 2008, ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference, New York City, NY, USA, August 3-6, 2008*, Vol. 4, pp. 629-631 (2008).
- ❑ **O Sardan**, D H Petersen, O Sigmund & P Bøggild, "Simulation of Topology Optimized Electrothermal Microgrippers", *Proceedings of 2008 Comsol Conference, Hannover, Germany, November 4-6, 2008*, (2008).
- ❑ **O Sardan**, B E Alaca, A D Yalcinkaya, P Bøggild, P T Tang & O Hansen, "Route to batch-compatible integration of MEMS with nanostructures", *Proceedings of IEEE-NANO 2007, 7th IEEE International Conference on Nanotechnology, Hong Kong, August 2-5, 2007*, pp. 1231-1234 (2007).
- ❑ P Bøggild, D H Petersen, J Kjelstrup-Hansen, K Mølhave, K N Andersen and **O Sardan**, "Microfabricated Tools for Pick-and-Place of Nanoscale Components", *Preprints of Mechatronics 2006, 4th IFAC Symposium on Mechatronic Systems, Heidelberg, Germany, September 12-14, 2006*, pp. 120-126 (2006).
- ❑ **O Sardan**, A D Yalcinkaya & B E Alaca, "Batch fabrication of self-assembled nickel-iron nanowires by electrodeposition", *Proceedings of IEEE-NEMS 2006, 1st IEEE International Conference on Nano Micro Engineered and Molecular Systems, Zhuhai, China, January 18-21, 2006*, pp. 1101-1104 (2006).

Conferences without Proceedings

- ❑ **O Sardan**, K Mølhave, O Sigmund & P Bøggild, "Topology Optimization of Electrothermal Microgrippers for Nanomanipulation", *NorWiP 2007, 3rd Workshop for Nordic Network for Women in Physics, Kgs. Lyngby, Denmark, August 16-17, 2007*.
- ❑ **O Sardan**, K Mølhave, O Sigmund & P Bøggild, "Topology Optimization of Electrothermal Microgrippers for Nanomanipulation", *DSF 2007, Danish Physical Society Meeting, Nyborg, Denmark, June 18-20, 2007*.
- ❑ **O Sardan**, B E Alaca, A D Yalcinkaya, P Bøggild, P T Tang & O Hansen, "Batch-Compatible Fabrication of Nanotweezers by Guided Self-Assembly", *NorWiP 2007, 2nd Workshop for Nordic Network for Women in Physics, Lund, Sweden, November 29-30, 2006*.
- ❑ **O Sardan**, A D Yalcinkaya & B E Alaca, "Design & Fabrication of Electrostatically Actuated Nanotweezers by Guided Self-Assembly", *NanoTR-I, Nanoscience and Nanotechnology 2005, Ankara, Turkey, May 29, 2005*.

Contributions

- ❑ Journal Cover: *Nanotechnology*, Vol. 19 (49).
- ❑ Book Cover: "Horizons of Nanotechnology" (in Danish).
- ❑ Online Article: "Nanotechnology Gets a Grip" on www.nanowerk.com.
- ❑ Online Article: "Microgrippers Pick-and Place Carbon Nanotubes" on www.nanotechweb.org.

LANGUAGES

- ❑ English: Speak fluently, read & write with high proficiency
- ❑ German: Beginner
- ❑ Dutch: Intermediate
- ❑ Danish: Intermediate

REFERENCES

- ❑ Erdem Alaca, Mechanical Engineering Department, Koç University.
E-mail: alaca@ku.edu.tr
- ❑ Peter Bøggild, DTU Nanotech, Department of Micro and Nanotechnology, Technical University of Denmark.
E-mail: peter.boggild@nanotech.dtu.dk
- ❑ Leon Abelmann, MESA+, Institute for Nanotechnology, University of Twente.
E-mail: l.abelmann@utwente.nl