

# Derek Kuochao Tseng

## Education:

<b>MS Electrical Engineering</b>	<b>University of California, Los Angeles</b>	June, 2010
Thesis: Lensfree on-Chip Microscopy for Telemedicine		
<b>BS Electrical Engineering</b>	<b>University of California, San Diego</b>	June, 2004

**Status:** U.S. Citizen

**Research Engineer**                      UCLA, BioPhotonics Lab                      06/08 - Present

- Design and create handheld prototypes for cellular imaging system.
- Leading 8-16 undergraduate students to do various designs.
- Handle and analyze bone marrow cell, e.coli, microbead and stained blood cells.
- 2009 Vodafone Americas Foundation wireless innovation project winning team.
- 2010 NetExplorateur project winner.
- Projects were reported in major media, such as The New York Times, BBC, Popular Mechanics, CNN, CBS and more

**Design Engineer**                      InnoSense LLC                      08/05 – 03/08

- Generated first-hand data to support PI with proposals and won two phase-one projects.
- Fabricated handheld optical-chemical sensor and prototype.
- Created software to process, display and store the data with LabView.
- Set up various opto-electronics sensors (PD and PMT) and LED/laser control circuits.
- Wide variety of experience with laser, LED and fiber optics alignment.
- Assembled optical fiber bundles, create fiber taper and fiber.
- Adopted to create sol gel, thin film coating, glass etching and sensing dye preparation.

## Other Work Experience:

Consultant	Holomic LLC	06/12 – Present
Design Engineer (intern)	Cal(It) <sup>2</sup>	01/04 – 06/04
Research Assistant	CSU, Long Beach	01/00 – 08/00

## Honor and Awards:

NSF Honorable Mentions	2009
Provost's Honors	2003, 2004
EIT Certificate	January, 2004

## REFEREED JOURNAL PUBLICATIONS

1. S.K.J. Ludwig, H. Zhu, S. Phillips, A. Shiledar, S. Feng, **D. Tseng**, L.A. van Ginkela, M.W.F. Nielen, and A. Ozcan, "Cellphone-based detection platform for rbST biomarker analysis in milk extracts using a microsphere fluorescence immunoassay," *Analytical and Bioanalytical Chemistry* DOI: [10.1007/s00216-014-7984-4](https://doi.org/10.1007/s00216-014-7984-4) (2014)
2. Q. Wei, R. Nagi, K. Sadeghi, S. Feng, E. Yan, S. Ki, R. Caire, **D. Tseng**, and A. Ozcan, "Detection and Spatial Mapping of Mercury Contamination in Water Samples using a Smart-Phone," *ACS Nano* DOI: [10.1021/nn406571t](https://doi.org/10.1021/nn406571t) (2014)

3. Q. Wei, H. Qi, W. Luo, **D. Tseng**, S. Jung Ki, Z. Wan, Z. Göröcs, L.A. Bentolila, T. Wu, Ren Sun, and A. Ozcan, "Fluorescent Imaging of Single Nanoparticles and Viruses on a Smart-Phone," *ACS Nano* [DOI:10.1021/nm4037706](https://doi.org/10.1021/nm4037706) (2013)
4. I. Navruz, A.F. Coskun, J. Wong, S. Mohammad, **D. Tseng**, R. Nagi, S. Phillips, and A. Ozcan, "Smart-phone based computational microscopy using multi-frame contact imaging on a fiber-optic array," *Lab on a Chip* [DOI:10.1039/C3LC50589H](https://doi.org/10.1039/C3LC50589H) (2013) - *Cover Article*
5. H. Zhu, I. Sencan, J. Wong, S. Dimitrov, **D. Tseng**, K. Nagashimaa, and A. Ozcan, "Cost-effective and Rapid Blood Analysis on a Cell-phone," *Lab on a Chip* [DOI:10.1039/C3LC41408F](https://doi.org/10.1039/C3LC41408F) (2013)
6. S.O. Isikman, W. Bishara, O. Mudanyali, I. Sencan, T. Su, **D. Tseng**, O. Yaglidere, U. Sikora, A. Ozcan, "Lensfree On-Chip Microscopy and Tomography for Bio-Medical Applications," *IEEE Journal of Selected Topics in Quantum Electronics* [DOI:10.1109/JSTQE.2011.2161460](https://doi.org/10.1109/JSTQE.2011.2161460) (2011) (*Invited Manuscript*)
7. G. Biener, A. Greenbaum, S.O. Isikman, K. Lee, **D. Tseng** and A. Ozcan, "Combined Reflection and Transmission Microscope for Telemedicine Applications in Field Settings," *Lab on a Chip* [DOI:10.1039/C1LC20169G](https://doi.org/10.1039/C1LC20169G) (2011)
8. H. Zhu, O. Yaglidere, T. Su, **D. Tseng**, and A. Ozcan, "Cost-effective and Compact Wide-field Fluorescent Imaging on a Cell-phone", *Lab on a Chip*, [DOI:10.1039/C0LC00358A](https://doi.org/10.1039/C0LC00358A) (2010)
9. T. Su, A. Erlinger, **D. Tseng**, and A. Ozcan, "A Compact and Light-weight Automated Semen Analysis Platform using Lensfree On-Chip Microscopy" *Analytical Chemistry* [DOI:10.1021/ac101845q](https://doi.org/10.1021/ac101845q) (2010)
10. O. Mudanyali, C. Oztoprak, **D. Tseng**, A. Erlinger, and A. Ozcan, "Detection of Waterborne Parasites using Field-portable and Cost-effective Lensfree Microscopy" *Lab on a Chip*, [DOI:10.1039/c004829a](https://doi.org/10.1039/c004829a) (2010) - Selected as part of *Emerging Investigators Special Issue*: [DOI: 10.1039/c0lc90044c](https://doi.org/10.1039/c0lc90044c)
11. T. Su, S.O. Isikman, W. Bishara, **D. Tseng**, A. Erlinger and A. Ozcan, "Multi-angle lensless digital holography for depth resolved imaging on a chip" *Optics Express* Vol. 18, pp. 9690-9711 [DOI:10.1364/OE.18.009690](https://doi.org/10.1364/OE.18.009690) (2010)
12. B. Khademhosseini, I. Sencan, G. Biener, T. Su, A.F. Coskun, **D. Tseng**, A. Ozcan, "Lensfree On-chip Imaging using Nano-structured Surfaces," *Applied Physics Letters* 96, 171106; [DOI:10.1063/1.3405719](https://doi.org/10.1063/1.3405719) (2010)
13. **D. Tseng**, O. Mudanyali, C. Oztoprak, S.O. Isikman, I. Sencan, O. Yaglidere and A. Ozcan, "Lensfree Microscopy on a Cell-phone" *Lab on a Chip* [DOI:10.1039/c003477k](https://doi.org/10.1039/c003477k) (2010) (*Cover Article*)
14. O. Mudanyali, **D. Tseng**, C. Oh, S.O. Isikman, I. Sencan, W. Bishara, C. Oztoprak, S. Seo, B. Khademhosseini, and A. Ozcan, "Compact, Light-weight and Cost-effective Microscope

based on Lensless Incoherent Holography for Telemedicine Applications” *Lab on a Chip*, DOI:10.1039/C000453G (2010)

15. O. Mudanyali, A. Erlinger, S. Seo, T. Su, **D. Tseng**, A. Ozcan, “Lensless On-chip Imaging of Cells Provides a New Tool for Cell-Biology and Diagnostics” *Journal of Visualized Experiments* (JoVE). DOI: 10.3791/1650 (2009)
16. S. Seo, T. Su, **D.K. Tseng**, A. Erlinger, and A. Ozcan, “Lensfree Holographic Imaging for On-Chip Cytometry and Diagnostics,” *Lab on a Chip*, DOI:10.1039/B813943A (2009)
17. T. Su, S. Seo, A. Erlinger, **D. Tseng**, and A. Ozcan, “Lensless on-chip cytometry merges high-throughput with point-of-care,” Special Issue of “*Optics in 2008*” *Optics & Photonics News*, December 2008
18. K Goswami, U Sampathkumaran, M Alam, **D Tseng**, AK Majurndar. Ormosil coating-based oxygen sensor for aircraft ullage. Proc. SPIE 2006. DOI: 10.1117/12.684769
19. U Sampathkumaran, B Barry, **D Tseng**, M Mushfiq, S Viswanathan, A Majumdar, K Goswami. All-optical fuel leak detector for monomethylhydrazine. ECS Transactions 2008

## REFEREED CONFERENCE PUBLICATIONS

1. Q. Wei, R. Nagi, K. Sadeghi, S. Feng, **D. Tseng**, and A. Ozcan, “Quantitative Mercury Sensing and Spatiotemporal Mapping Using a Smartphone,” BMES (Biomedical Engineering Society) Annual Meeting, (October 22-25, 2014), San Antonio, Texas, USA
2. Q. Wei, H. Qi, W. Luo, **D. Tseng**, L.A. Bentolila, T. Wu, R. Sun, and A. Ozcan, "Smartphone-based Microscopy for Imaging of Single Fluorescent Nanoparticles and Viruses", 15th Annual UC Systemwide Bioengineering Symposium, June 18-20, 2014, University of California, Irvine, USA
3. H.C. Koydemir, Z. Gorocs, E.R. McLeod, **D. Tseng** and A. Ozcan, "Smartphone enabled waterborne pathogen detection using fluorescence microscopy", 15th Annual UC Systemwide Bioengineering Symposium, June 18-20, 2014, University of California, Irvine, USA
4. Q. Wei, R. Nagi, K. Sadeghi, S. Feng, **D. Tseng**, and A. Ozcan, "Spatio-temporal Mapping of Mercury Contamination using a Smartphone", 15th Annual UC Systemwide Bioengineering Symposium, June 18-20, 2014, University of California, Irvine, USA
5. Q. Wei, H. Qi, W. Luo, **D. Tseng**, L. A. Bentolila, T.-T. Wu, R. Sun, and A. Ozcan, "Single Nanoparticle and Virus Detection Using a Smart Phone Based Fluorescence Microscope", OSA Conference on Lasers and Electro-optics (CLEO '14), June 8-13, 2014, San Jose, CA USA, Paper # AW3L.1
6. H. Zhu, I. Sencan, J. Wong, S. Dimitrov, **D. Tseng** and A. Ozcan, “Blood Analysis on a Cellphone,” BMES (Biomedical Engineering Society) Annual Meeting, (September 25-28, 2013), Seattle, WA, USA

7. H. Zhu, I. Sencan, J. Wong, S. Dimitrov, **D. Tseng**, A. Ozcan, "Blood Analysis on a Smart Phone", 14th Annual UC Systemwide Bioengineering Symposium, June 19-21, 2013, University of California, San Diego, USA
8. O. Mudanyali, **D. Tseng**, C. Oztoprak, S. O. Isikman, I. Sencan, O. Yaglidere, and A. Ozcan, "Lab-on-a-cellphone: emerging platform for telemedicine global health," SPIE Defense, Security, and Sensing Conference, (April 23-27 2012) Baltimore, USA, Paper # 8371A-2
9. T.-W. Su, A. Erlinger, **D. Tseng**, and A. Ozcan, "Field-portable Fertility Test using Lensless Microscopy on a Chip," SPIE Defense, Security, and Sensing Conference, (April 23-27 2012) Baltimore, USA, Paper # 8371A-4
10. O. Mudanyali, W. Bishara, C. Oztoprak, **D. Tseng**, A. Erlinger, and A. Ozcan, "High-Throughput Screening Of Water Quality Using Field-Portable Lensfree Computational Microscopes", University of California, Global Health Day, February 4, 2012, University of California, Berkeley, USA
11. O. Mudanyali, **D. Tseng**, S. O. Isikman, C. Oztoprak, I. Sencan, W. Bishara, O. Yaglidere and A. Ozcan, "Compact and Cost-effective Lensless Telemedicine Microscopy for Global Health Applications," IEEE Global Humanitarian Technology Conference (GHTC), Seattle, Washington (October 30 - November 1, 2011)
12. H. Zhu, O. Yaglidere, T. Su, **D. Tseng**, and A. Ozcan, "Wide-field fluorescent microscopy on a cell-phone," BMES - Biomedical Engineering Society Annual Meeting, Hartford, Connecticut (October 12-15, 2011)
13. G. Biener, A. Greenbaum, S. Isikman, K. Lee, **D. Tseng** and A. Ozcan, "Field-Portable Reflection and Transmission Microscope," BMES - Biomedical Engineering Society Annual Meeting, Hartford, Connecticut (October 12-15, 2011)
14. G. Biener, A. Greenbaum, S.O. Isikman, K. Lee, **D. Tseng** and A. Ozcan, "Field-Portable Reflection and Transmission Microscope for Telemedicine Applications," MicroTAS 2011 - The 15th International Conference on Miniaturized Systems for Chemistry and Life Sciences, Seattle, USA (October 2-6, 2011)
15. H. Zhu, O. Yaglidere, T. Su, **D. Tseng**, and A. Ozcan, "Wide-field Fluorescent Microscopy on a Cell-phone," IEEE Engineering in Medicine and Biology Society (EMBC'11), Boston, MA, USA (August 30 -September 3, 2011)
16. H. Zhu, O. Yaglidere, T-W, Su, **D. Tseng**, and A. Ozcan, "Cost-effective and Field-portable Fluorescent Microscopy on a Cell-phone," 12th Annual UC Systemwide Bioengineering Symposium, June 13-15, 2011, University of California, San Barbara, USA
17. G. Biener, A. Greenbaum, S.O. Isikman, K. Lee, **D. Tseng**, and A. Ozcan, "Dual-mode Telemedicine Microscope," 12th Annual UC Systemwide Bioengineering Symposium, June 13-15, 2011, University of California, Santa Barbara, USA

18. T.-W. Su, A. Erlinger, **D. Tseng**, and A. Ozcan, "Lensless On-chip Microscope as a Portable Semen Analysis Device," 12th Annual Systemwide Bioengineering Symposium, June 13-15, 2011, University of California, Santa Barbara, USA
19. O. Mudanyali, **D. Tseng**, C. Oztoprak, S. O. Isikman, I. Sencan, O. Yaglidere, and A. Ozcan, "Lab on a Cell-phone as an emerging Telemedicine Platform", SPIE Defense, Security, and Sensing Conference, (April 25-29 2011) Orlando, USA, paper # 8029A-9
20. T. Su, A. Erlinger, **D. Tseng**, and A. Ozcan, "Field-Portable Semen Analysis Using Lensless Microscopy On a Chip," SPIE Defense, Security, and Sensing Conference, (April 25-29 2011) Orlando, USA, Paper # 8029A-46
21. O. Mudanyali, **D. Tseng**, S. O. Isikman, C. Oztoprak, I. Sencan, W. Bishara, O. Yaglidere and A. Ozcan, "Light-weight and Cost-effective Lensfree Microscopy for Wireless Health Applications", MMVR18, NextMed 2011, Medicine Meets Virtual Reality, February 2011, Newport Beach, CA, USA
22. S.O. Isikman, C. Oh, **D.K. Tseng**, O. Mudanyali, A. Ozcan, "A compact and light-weight differential interference contrast (DIC) microscope for telemedicine applications," SPIE *Photonics West*, Advanced Biomedical and Clinical Diagnostic Systems IX, January 2011, San Francisco, CA, paper # 7890-5
23. T. Su, A. Erlinger, **D. Tseng**, and A. Ozcan, "Automated On-Chip Semen Analysis using a Handheld Lensfree Holographic Microscope", SPIE *Photonics West*, Optical Diagnostics and Sensing XI: Toward Point-of-Care Diagnostics, January 2011, San Francisco, CA, paper # 7906A-5
24. O. Mudanyali, **D. Tseng**, S. O. Isikman, C. Oztoprak, I. Sencan, W. Bishara, O. Yaglidere, and A. Ozcan, "Lensfree Telemedicine Microscopy for Global Health Challenges", SPIE *Photonics West*, Design and Quality for Biomedical Technologies IV, January 2011, San Francisco, CA, paper # 7891-18
25. O. Mudanyali, C. Oztoprak, **D. Tseng**, A. Erlinger, and A. Ozcan, "Field-Portable Lensfree On-Chip Microscopy for Detection of Waterborne Parasites", SPIE *Photonics West*, Frontiers in Biological Detection: From Nanosensors to Systems, January 2011, San Francisco, CA, paper # 7888-13
26. B. Khademhosseini, I. Sencan, G. Biener, T. Su, A.F. Coskun, **D. Tseng**, and A. Ozcan, "Incoherent lensfree imaging on a chip using compressive decoding of nanostructured surfaces," SPIE *Photonics West*, Nanoscale Imaging, Sensing, and Actuation for Biomedical Applications VII, January 2011, San Francisco, CA, paper # 7908-21
27. O. Mudanyali, C. Oztoprak, **D. Tseng**, A. Erlinger, A. Ozcan, "Water Quality Management using a Cost-effective and Field-portable Lensfree On-Chip Microscope," MicroTAS 2010 - The 14th International Conference on Miniaturized Systems for Chemistry and Life Sciences, October 3-7, 2010, Groningen, The Netherlands
28. **D. Tseng**, O. Mudanyali, C. Oztoprak, S.O. Isikman, I. Sencan, O. Yaglidere and A. Ozcan, "Lensfree Telemedicine Microscope on a Wireless Phone," MicroTAS 2010 - The 14th

International Conference on Miniaturized Systems for Chemistry and Life Sciences, October 3-7, 2010, Groningen, The Netherlands

29. T. Su, S.O Isikman, W. Bishara, **D. Tseng**, A. Erlinger, and A. Ozcan, "Multi-angle lensfree holographic imaging for 3D cytometry on a chip," ASME 5<sup>th</sup> Frontiers in Biomedical Devices Conference, September 20-21, 2010, Newport Beach, CA
30. T-W. Su, **D. Tseng** and A. Ozcan, "Lensless on-chip microscope as a portable semen analysis device," BMES Annual Meeting, October 6-9 2010, Austin Texas USA
31. B. Khademhosseini, I. Sencan, G. Biener, T. Su, A.F. Coskun, **D. Tseng**, A. Ozcan, "Lensfree Incoherent Microscopy on Nano-Structured Chips," BMES Annual Meeting, October 6-9 2010, Austin Texas USA
32. O. Mudanyali, **D. Tseng**, S.O. Isikman, I. Sencan, W. Bishara, C. Oztoprak, S. Seo, B. Khademhosseini, and A. Ozcan, "Compact and Light-weight Telemedicine Microscope based on Lensfree On-Chip Imaging," BMES Annual Meeting, October 6-9 2010, Austin Texas USA
33. B. Khademhosseini, I. Sencan, G. Biener, T. Su, A.F. Coskun, **D. Tseng**, A. Ozcan, "Nano-structured surfaces for lensless incoherent microscopy on a chip" 11th Annual UC Systemwide Bioengineering Symposium, June 17-19, 2010, University of California, Davis, USA
34. O. Mudanyali, **D. Tseng**, S.O. Isikman, I. Sencan, W. Bishara, C. Oztoprak, S. Seo, B. Khademhosseini, and A. Ozcan, "Light-weight, Field-portable and Cost-effective Lensfree Microscopy for Telemedicine Applications," 11th Annual UC Systemwide Bioengineering Symposium, June 17-19, 2010, University of California, Davis, USA
35. T. Su, S.O. Isikman, W. Bishara, **D. Tseng**, A. Erlinger and A. Ozcan, "Three-Dimensional On-Chip Cytometry by Multi-angle Lensless Holographic Imaging," 11th Annual UC Systemwide Bioengineering Symposium, June 17-19, 2010, University of California, Davis, USA
36. T. Su, S. O. Isikman, W. Bishara, **D. Tseng**, A. Erlinger, and A. Ozcan, "Multi-angle Lensless Holography for Depth Resolved High-throughput Imaging of Cells On a Chip," IEEE Photonics Society, Winter Topical Meeting on Advanced Imaging in Bio-Photonics, (January 11-13 2010) Majorca, Spain
37. S. Isikman, S. Seo, I. Sencan, **D. Tseng**, O. Mudanyali, T. Su, A. Erlinger, and A. Ozcan, "Incoherent On-chip Cell Holography for Sub-cellular Imaging and Point-of-Care Diagnostics," SPIE *Photonics West Conference*, Imaging, Manipulation, & Analysis of Biomolecules, Cells, and Tissues VIII, January 2010, San Francisco, CA, paper # 7568-86
38. S. Seo, T. Su, **D.K. Tseng**, A. Erlinger, and A. Ozcan, "On-chip Cytometry using Lensless Digital Holography," OSA Conference on Lasers and Electro-optics (*CLEO '09*) (May 31-June 4, 2009)

39. O. Mudanyali, **D. Tseng**, S.O. Isikman, I. Sencan, W. Bishara, C. Oztoprak, S. Seo, B. Khademhosseini, and A. Ozcan, "Light-weight, Field-portable and Cost-effective Lensfree Microscopy for Telemedicine Applications," 11th Annual UC Systemwide Bioengineering Symposium, June 17-19, 2010, University of California, Davis, USA
40. T. Su, S.O. Isikman, W. Bishara, **D. Tseng**, A. Erlinger and A. Ozcan, "Three-Dimensional On-Chip Cytometry by Multi-angle Lensless Holographic Imaging," 11th Annual UC Systemwide Bioengineering Symposium, June 17-19, 2010, University of California, Davis, USA
41. T. Su, S. O. Isikman, W. Bishara, **D. Tseng**, A. Erlinger, and A. Ozcan, "Multi-angle Lensless Holography for Depth Resolved High-throughput Imaging of Cells On a Chip," IEEE Photonics Society, Winter Topical Meeting on Advanced Imaging in Bio-Photonics, (January 11-13 2010) Majorca, Spain
42. S. Isikman, S. Seo, I. Sencan, **D. Tseng**, O. Mudanyali, T. Su, A. Erlinger, and A. Ozcan, "Incoherent On-chip Cell Holography for Sub-cellular Imaging and Point-of-Care Diagnostics," SPIE *Photonics West Conference*, Imaging, Manipulation, & Analysis of Biomolecules, Cells, and Tissues VIII, January 2010, San Francisco, CA, paper # 7568-86
43. S. Seo, T. Su, **D.K. Tseng**, A. Erlinger, and A. Ozcan, "On-chip Cytometry using Lensless Digital Holography," OSA Conference on Lasers and Electro-optics (*CLEO '09*) (May 31-June 4, 2009)

## BOOK CHAPTERS

1. S. O. Isikman, W. Bishara, O. Mudanyali, T. Su, **D. Tseng** and A. Ozcan, *Lensfree Computational Microscopy Tools for On-Chip Imaging of Bio-Chips*, Editors: Robert M Westervelt & David Issadore; Point of Care Diagnostics on a Chip, Springer, ISBN: 978-3-642-29267-5 (Print) 978-3-642-29268-2 (Online) (published in 2013)