ANA DOBLAS, PHD

UMass Dartmouth
Department of Electrical and Computer Engineering
Science & Engineering 221 B
Dartmouth, MA 02747
UMass Dartmouth website: https://www.umassd.edu/directory/adoblas/
Laboratory website: https://sites.google.com/view/oirl/home?authuser=1

Phone: 508-999-8471 (office)
Phone: 919.945.9805 (mobile)
Email: adoblas@umassd.edu

EDUCATION

Doctor in Physics with Honors 2011-2015
University of Valencia, Valencia, Spain.
M.Sc. in Advanced Physics 2010-2011
University of Valencia, Valencia, Spain.
Bachelor in Physics (concentration in Optics and Applied Physics) 2005-2010
University of Valencia, Valencia, Spain.

EXPERIENCE

Assistant Professor Sept. 2023 - present
Department of Electrical and Computer Engineering, UMass Dartmouth, Dartmouth, MA
Assistant Professor Jan. 2019 – Aug. 2023
Department of Electrical and Computer Engineering, The University of Memphis, Memphis, TN
Research Assistant Professor Sept. 2016 – Jan. 2019
Department of Electrical and Computer Engineering, The University of Memphis, Memphis, TN.
Postdoctoral Research Associate Sept. 2015 – Sept. 2016
Department of Physics and Astronomy, University of North Carolina, Chapel Hill, NC.
2013-2015 **Instructo**r, University of Valencia (Spain), Department of Optics.
PHD Research Assistant Sept. 2011 – Sept. 2015
Department of Optics, University of Valencia, Valencia, Spain.
Dissertation Title: New advances in high-resolution optical microscopy.
Graduate Research Assistant Sept. 2010 – Sept. 2011
Department of Optics, University of Valencia, Valencia, Spain.
Dissertation Title: Axial modulation of periodic illumination patterns in microscopy.
Undergraduate Research Assistant
Department of Optics, University of Valencia, Valencia, Spain.
Project: Imaging and 3D display Oct. 2009
Spanish Senior Fellowship Sept. 2009 – July 2010

TEACHING

University of Massachusetts (UMass) Dartmouth, MA

- ECE 320 – Discrete-Time Linear Systems.
- ECE 321 – Continuous-Time Linear Systems.
- ECE 403/591 – Special Topics ECE, Linear Optical Systems.
- ECE 596 – Directed Study, Fundamentals of Optics and Photonics.
- ECE 475/574 – Discrete-Time Signal Processing
- ECE 513 – Fundamentals of Optics and Photonics

The University of Memphis, Memphis, TN

- EECE 2207 – Engineering Math Applications.
- EECE 3240 – Electromagnetic Field Theory.
- EECE 4243/6243 – Linear Optical Systems.
- EECE 4242/6242 – Electro-Optics.
- EECE 4901/6901 – Intro to Optical Design.

University of Valencia, Valencia (Spain)

- Clinical exploration methods (Lab *Instructor)*.
- Optical and optometric instruments (Lab *Instructor)*.

HONORS AND CERTIFICATIONS

- **Recipient of the OER Creator Program** for Summer/Fall 2024 to support developing the OER resources of the ECE 513 course, UMass Dartmouth.
- **Laureate of the Fumio Okano Best 3D paper** for "Overview of computational advances in quantitative phase imaging using digital holographic microscopy" in 2024.
- **R. Eugene Smith Professorship for outstanding research accomplishments, The University of Memphis,** 2021-22 and 2022-23
- **Endorsement UMRF Ventures Professor**, **The University of Memphis,** 2021-2022.
- **National Science Foundation (NSF) Faculty Early Career Development (CAREER)** award for her project titled "Three-dimensional super-resolution light microscopy of thick, unprocessed biological samples," in 2021.
- **Laureate of the Fumio Okano Best 3D paper** for "Digital holographic microscopy as a screening technology for diabetes" in 2020.
- **Laureate of the Fumio Okano Best 3D** paper for "Three-dimensional microscopy through liquid-lens axial scanning" in 2016.
- **Doctor by the University of Valencia with an excellent grade and with the cum laude and International Doctor mentions**, 2015.
- **3-month Awarded Scholarship** funded by the program "Atracció de Talent" of VLC-CAMPUS at the University of Valencia to visit and participate in research with Dr. Chrysanthe Preza (University of Memphis, summer of 2013) and Dr. Jorge Garcia-Sucerquia (Universidad Nacional de Colombia Sede Medellín, summer of 2014).
- **Predoctoral research scholarship** funded by the program "Atracció de Talent" of VLC-CAMPUS at the University of Valencia, January 2012 - September 2015.
- **Graduate Scholarship** funded by the 3D Imaging and Display Laboratory at the University of Valencia, September 2010-December 2011.
- **Undergraduate Scholarship** funded by the Spanish Ministry of Education and Science, 2009/2010 academic year.

PROFESSIONAL SOCIETIES

Optical (former The Optical Society of America, OSA)	2014 – present
International Society for Optical Engineering (SPIE)	2014 – present
IEEE Photonics and Signal Processing Society	2020 – present

SERVICE

Grant Reviewer

National Science Foundation	Sept. 2021 – present
Army Research Office	present

Journal Reviewer

Optics Letters	2015 – present
Optics and Lasers in Engineering (OLEN)	2015 – present
Scanning	2015
Applied Optics	2016 – present
Journal of Display Technology	2016
Optical Engineering	2017
Optik	2017, 2022
Optics and Lasers Technologies	2017 – present
Journal of Biomedical Optics	2018 – present
Optics Express	2018, 2020, 2025-present
Tissue Engineering	2018
IEEE Photonics Tech Letter	2019
Biomedical Optics Express	2020 – present
Frontiers	2020
Sensors	2020 – present
Scientific Report	2021 - present
Cells	2022
Applied Physics B	2022
American Journal of Physics	2026
SPIE BIOS	2025
Optics Communication	2025
Photonics Research	2025

Abstract Reviewer

OSA Imaging Congress 2021 – present
3D Image Acquisition and Display: Technology, Perception and Applications conference.
SPIE Optics + Photonics 2025
Program committee, Optics and Photonics for Information Processing XIX, Conference 13604

Topical Editor

Optics Letters, Imaging Systems and 3D Optical Microscopy Nov. 2021 – present

Feature Editor

Joint – Biomedical Optics Express, Optics Express, and Applied Optics.
Computational Optical Sensing and Imaging 2025 present

Optics Express, 3D Image Acquisition and Display: Technology, Perception and Applications June 2022 – present

Sensors, Optical Instruments and Sensors and Their Applications April 2023- October 2024

Sensors, Imaging, Sensing and Applications in Digital Holographic Microscopy Nov. 2022 – March 2023

Sensors, Three-Dimensional (3D) Biophotonics Sensing and Reconstruction towards Biomedical Research Nov. 2020 – May 2022

Optica Mentor August 2024 – present
Member of the Optica mentorship program designed to connect students with professionals in optics and photonics as a way to assist students with overcoming challenges they face in their careers. Participants are able to choose from a variety of different discussion topics including, technical support, professional development support, and navigating personal challenges.

GRANT SUPPORT

UMass Dartmouth **Role: Co-PI** **01/01/2026 – 12/31/2026**
2026 Internal Research Seed Funding Program
First-of-its-Kind Thermal Triaxial System with Integrated Real-Time Microstructural Imaging (PI: Samarakoon).

NSF EMPD Grant **Role: PI** **10/15/2025 – 09/30/2028**
Improved Lensless Microscope Using a Multicolor Multiplexed Approach to Provide High-throughput Images with Enhanced Resolution

MUST IV – Office of Naval Research (ONR) **Role: PI** **05/01/2025 – 04/30/2028**
Underwater microplastic detection and characterization by developing a polarization-based lensless system

NSF CAREER Grant **Role: PI** **03/15/2021 – 03/14/2026**
Three-dimensional super-resolution light microscopy of thick, unprocessed biological samples

US Embassy in Spain, Department of State **Role: PI** **10/15/2022 – 09/30/2023**
Enhancing career opportunities in STEM for Spanish/Andorran undergraduate students in the United States

University of Memphis **Role: PI** **11/30/2022 – 06/30/2023**
Community of Research Scholars (CoRS) Grant
Investigation of a Multiplexed Wearable Sensor to identify Engineering undergraduate students at risk in their major by means of artificial intelligence.

University of Memphis Faculty Research Grant **Role: PI** **07/01/2018 – 06/30/2019**
Integration of a novel cost-effective structured illumination add-on module into a commercial microscope

University of Memphis Gap Funding **Role: Co-Inv.** **03/01/2017 – 08/31/2018**
Imaging cell motility in 3D-collagen gels by structured illumination digital holographic microscopy (SIDHM)

University of Memphis FIT Grant **Role: Inv.** **08/01/2017 – 06/30/2018**
Multi-focal-light sheet structure illumination fluorescence microscopy: illumination module, method, and software to obtain 3D super-resolved images with improved optical-sectioning

PATENTS

1. E. Sánchez-Ortiga, **A. Doblas**, G. Saavedra, M. Martínez-Corral, and J. Garcia-Sucerquia, “Microscope, method and computer program for obtaining quantitative study of transparent

samples by digital holographic microscopy," Spanish patent ES 2 534 960 A1, and US patent US 21060252880 A1.
2. C. Preza, **A. Doblas**, M. Martínez-Corral, G, Saavedra and J. C. Barreiro, "Multi-focal light-sheet structured illumination fluorescence microscopy system," US 62/527.232. Filing date 07/16/2018.
3. A. Doblas, R. Isaac, and J. Garcia-Sucerquia, "Apparatus and method to convert a regular bright-field microscope into a PS-QPI System," US 17/382,164 and PCT/US21/42630.
4. A. Doblas, G. Cottle, and F. Bouchard, "Double-sided, multiplane, backward refraction imaging device for use in Optics related STEM education," US Application No. 19/349,590. Filling date: 10/03/2025.

JOURNAL PUBLICATIONS

Published (Undergraduate Student author & Graduate student author)

1. K. Ortega-Sanchez, M. Gil-Herrera, S. Plaza, A. Padilla-Vivanco, E. Banoth, V. Claveria, R. Castaneda, **A. Doblas**, and C. Trujillo, "Deoxygenation-free Digital Holographic Microscopy discriminates sickle-cell disease in a pilot Colombian cohort via phase and shape metrics," Opt. Express 34(7), 13405-13419 (2026). doi: 10.1364/OE.580193.
2. S. Obando-Vasquez, A. Schneider, and **A. Doblas**, "Enabling Super-Resolution Quantitative Phase Imaging via OpenSRQPI - A Standardized Plug-and-Play Open-Source Tool for Digital Holographic Microscopy with Structured and Oblique Illumination," Electronics 14(22), 4513 (2025). doi.:10.3390/electronics14224513
3. K. Ortega-Sanchez, R. Restrepo, A. Padilla-Vivanco, R. Castaneda, **A. Doblas**, and C. Trujillo, "Intricate Quantitative Phase Imaging via Vortex-Legendre High-Order Phase Compensation," Opt. Lasers Eng. 195, 109318 (2025).
1. S. Obando-Vasquez, R. Castaneda, R. Restrepo, C. Trujillo, and **A. Doblas**, "Generalized computational framework for phase image reconstruction in structured illumination digital holographic microscopy," Opt. Express 33(7), 16454-16467 (2025).
2. J. Morales, S. Obando-Vasquez, **A. Doblas,** and C. Trujillo, "HoloStream: A GPU-powered high-speed user interface for holographic microscopy imaging," Opt. Express 33(7), 1564015660 (2024).
3. C. Trujillo, L. Thompson, O. Skalli, and **A. Doblas**, "Unpaired data training enables super-resolution confocal microscopy from low-resolution acquisitions," Opt. Letters 49 (20), 5775-5778 (2024).
4. R. Castaneda, C. Trujillo, and **A. Doblas**, "A Human Erythrocytes Dataset for Learning-based Model Training," Data in Brief **54**, 110424 (2024).
5. M. J. Lopera, M. Trusiak, A. Doblas, H. Ottevaere, and C. Trujillo, "Mueller-Gabor holographic microscopy," Optics and Lasers in Engineering 178, 108191 (2024).
6. R. Castaneda, C. Trujillo, and **A. Doblas**, "In-focus quantitative phase imaging from defocused off-axis holograms: synergistic reconstruction framework," Opt. Letters 48(23), 6244-6247 (2023). doi: 10.1364/OL.506400.
7. S. Obando-Vasquez, **A. Doblas**, and C. Trujillo, "Semi-heuristic phase compensation in digital holographic microscopy for stable and accurate quantitative phase imaging of moving objects," Opt. Lasers Eng. 174, 107937 (2024). doi: 10.1016/j/optlaseng.2023.107937.
8. A. Abraham, K. Balachandran, and **A. Doblas**, "Research Outreach Interdisciplinary Activity to classify olive oil blends integrating multicolor imaging, image processing, and machine learning," Undergraduate Research Journal 3(2), 6. doi: /10.58361/2766-3590.1062.

9. B. Bogue-Jimenez, C. Trujillo, and **A. Doblas**, "Comprehensive Tool for a Phase Compensation Reconstruction Method in Digital Holographic Microscopy Operating in Non-Telecentric Regime," Plos ONE 18(9), e0291103 (2023).
10. K. Dahal, B. Bogue-Jimenez, and **A. Doblas**, "Global Stress Detection Framework Combining a Reduced Set of HRV Features and Random Forest Model," Sensors 23(11), 5220 (2023). doi.:10.3390/s23115220
11. B. Javidi, H. Hua, A. Stern, M. Martinez-Corral, O. Matoba, **A. Doblas,** and S. Thibault, "Focus Issue Introduction: 3D Image Acquisition and Display: Technology, Perception, and Applications," Opt. Express 31(7), 11557-11560 (2023). doi: 10.1364/OE.487783.
12. E. Costello, L. Hamilton, and **A. Doblas**, "Design & evaluation of a confocal scanning microscope using off-of-shelf optical components by means of Zemax OpticStudio optical design software," QuaesitUM Undergraduate Research Journal, vol. 10 (2023).
13. R. Castaneda, C. Trujillo, and **A. Doblas**, "pyDHM: A Python library for applications in Digital Holographic Microscopy," Plos ONE 17(10), e0275818 (2022).
14. S. Obando-Vasquez, **A. Doblas,** and C. Trujillo, "Apparatus and method to recover the Mueller matrix in bright-field microscopy," American Journal of Physics 90, 702 (2022). doi: 10.1119/5.0081673.
15. A. Doblas, C. Hayes-Rounds, R. Isaac, and F. Perez, "Single-shot 3D topography of transmissive and reflective samples with a dual-mode telecentric-based digital holographic microscope," Sensors 22, 3793 (2022).
16. B. Bogue-Jimenez, X. Huang, D. Powell, and **A. Doblas**, "Selection of noninvasive features in wrist-based wearable sensors to predict blood glucose concentrations using machine learning algorithms," Sensors 22(9), 3534 (2022).
17. E. Costello, and **A. Doblas**, "Two-Way Pepper Ghost Tunnel: Theory, Design and Analysis," QuaesitUM Undergraduate Research Journal, vol. 9 (2022).
18. R. Castaneda, J. Garcia-Sucerquia, and **A. Doblas**, "Speckle noise reduction in coherent imaging systems via Hybrid Median-Mean Filter," Opt. Engineering 60(12), 123107 (2021).
19. R. Castaneda, C. Trujillo, and **A. Doblas**, "Video-Rate Quantitative Phase Imaging Using a Digital Holographic Microscope and a Generative Adversarial Network," Sensors 21(23), 8021 (2021).
20. R. Castaneda, and **A. Doblas**, "Fast and automatic algorithm to universal recovery of the quantitative phase distribution in digital holographic microscopy," Appl. Opt. 60(32), 10214-10220 (2021).
21. R. Castaneda, C. Buitrago-Duque, J. Garcia-Sucerquia, and **A.Doblas**, "Fast-iterative blind phase-shifting digital holographic microscopy using two images," Appl. Opt. 59(24) 7469-7476 (2020).
22. C. Hayes-Round, B. Bogue-Jimenez, J. Garcia-Sucerquia, O. Skalli, and **A. Doblas**, "Advantages of Fresnel biprism-based Digital Holographic Microscopy in Quantitative Phase Imaging," J. Biomed. Opt. 25(8), 086501 (2020), doi: 10.1117/1.JBO.25.8.086501.
23. A. Doblas, C. Buitrago-Duque, A. Robinson, J. Garcia-Sucerquia, and, "Phase-Shifting Digital Holographic Microscopy with iterative blind reconstruction algorithm," Appl. Opt., 58(34), G311-G317 (2019).
24. T. O'Connor, **A. Doblas**, and B. Javidi, "Structured illumination in compact and field-portable 3D-printed shearing digital holographic microscopy for resolution enhancement," Opt. Letters 44(9), 2326-2329 (2019).
25. S. Hossein, S. Yaghoubi, S. Ebrahimi, M. Dashtdar, **A. Doblas**, and B. Javidi, "Common-path, single-shot phase-shifting digital holographic microscopy using a Ronchi ruling," Appl. Phys. Letter 114, 183701 (2019).
26. H. Shabani, **A. Doblas**, G. Saavedra, and C. Preza, "Optical transfer function engineering using a tunable 3D structured illumination microscope," Opt. Letters 44(7), 1560-1563 (2019).

27. A. Doblas, S. Bedoya, and C. Preza, “Wollaston prism-based structured illumination microscope with tunable-frequency,” Appl. Opt. 58(7), B1-B8(2019).
28. A. Doblas, H. Shabani, G. Saavedra, and C. Preza, “Tunable-frequency three-dimensional structured illumination microscopy with reduced data-acquisition,” Opt. Express 26(23), 30492-30505 (2018).
29. N. Patwary, **A. Doblas,** and C. Preza, “Image restoration approach to address reduced modulation contrast in structured illumination microscopy,” Biomed. Opt. Express 9(4), 1630-1647 (2018**).**
30. H. Shabani, **A. Doblas**, G. Saavedra, E. Sanchez-Ortiga and C. Preza, “Improvement of two-dimensional structured illumination microscopy with an incoherent illumination pattern” Appl. Optics 57(7), B92-B101 (2018).
31. N. Patwary, H. Shabani, **A. Doblas**, G. Saavedra, and C. Preza, “Experimental validation of a customized phase mask designed to enable efficient computational optical sectioning microscopy through wavefront encoding” Appl. Optics 56(9), D14-D23 (2017).
32. J. Barrick, **A. Doblas**, M. R. Gardner, P. R. Sears, L. E. Ostrowski, and A. L. Oldenburg, “High-speed and high-sensitivity parallel spectral-domain optical coherence tomography using a supercontinuum light source,” Opt. Lett., 41(24), 5620-5623 (2016).
33. C. Trujillo, **A. Doblas**, G. Saavedra, M. Martinez-Corral and J. Garcia-Sucerquia, “Phase-shifting by means of an electronically tunable lens: quantitative phase imaging of biological specimens with digital holographic microscopy,” Opt. Lett., 41(7), 1416-1419 (2016).
34. A. Doblas, E. Roche, F. J. Ampudia-Blasco, M. Martínez-Corral, G. Saavedra and J. Garcia-Sucerquia, “Diabetes screening by telecentric digital holographic microscopy,” J. Microsc., 261(3), 285-290 (2016). doi: 10.1111/jmi.12331.
35. A. Doblas, M. Martínez-Corral, G. Saavedra, and J. Garcia-Sucerquia “Digital holographic microscopy for diabetes screening,” SPIE Newsroom (2016). doi: 10.1117/2.1201604.006435
36. S. V. King, **A. Doblas**, N. Patwary, G. Saavedra, M. Martínez-Corral, and C. Preza, “Spatial light modulator phase mask implementation of wavefront encoded 3D computational-optical microscopy,” Appl. Optics 54, 8587-8595 (2015).
37. A. Doblas, D. Hincapie-Zuluaga, G. Saavedra, M. Martínez-Corral and J. Garcia-Sucerquia, “Physical compensation of phase curvature in digital holographic microscopy by use of programmable liquid lens,” Appl. Opt., 54, 5229-5233 (2015).
38. A. Doblas, E. Sánchez-Ortiga, M. Martínez-Corral and J. Garcia-Surcerquia, “Study of spatial lateral resolution in off-axis digital holographic microscopy,” Opt. Commun. 352, 63-69 (2015).
39. M. Martínez-Corral, **A. Doblas**, E. Sánchez-Ortiga, J. Sola-Pikabea and G. Saavedra, “Static axial scanning in 3D microscopy through electrically controlled liquid lens,” SPIE Newsroom (2015). doi: 10.1117/2.1201503.005832.
40. M. Martínez-Corral, P.-Y. Hsieh, **A. Doblas**, E. Sánchez-Ortiga, G. Saavedra and Y.-P. Huang, “Fast axial-scanning widefield microscopy with constant magnification and resolution,” J. Display Technol 11, 913-920 (2015). doi: 10.1109/JDT.2015.2404347.
41. A. Doblas, E. Sánchez-Ortiga, M. Martínez-Corral, G. Saavedra and J. Garcia-Surcerquia, “Accurate single-shot quantitative phase imaging of biological specimens with telecentric digital holographic microscopy,” J. Biomed. Opt. 19(4), 046022- (2014).
42. E. Sánchez-Ortiga, **A. Doblas**, G. Saavedra, M. Martínez-Corral and J. Garcia-Sucerquia, “Off-axis Digital Holographic Microscopy: practical design parameters for operating at diffraction limit,” Appl. Opt. 53(10), 2058-2066 (2014).
43. A. Doblas, G. Saavedra, M. Martínez-Corral, J. C. Barreiro, E. Sánchez-Ortiga and A. Llavador, “Axial resonance of periodic patterns by using a Fresnel biprism,” J. Opt. Soc. Am. A 30(1), 140-148 (2013).

44. A. Doblas, E. Sánchez-Ortiga, M. Martínez-Corral, G. Saavedra, P. Andres, and J. Garcia-Sucerquia, "Shift-variant digital holographic microscopy: innacuracies in quantitative phase imaging," Opt. Lett. 38(8), 1352-1354 (2013).
45. E. Sánchez-Ortiga, G. Saavedra, C. J. R. Sheppard, **A. Doblas** and M. Martínez-Corral, "Scanning microscopy with spatial sampling of the detector plane," Opt. Pur. Apl. 46(2), 137-146 (2013).
46. I. Escobar, G. Saavedra, M. Martínez-Corral, A. Calatayud and **A. Doblas**, "Shaded-Mask Filtering for Extended Depth-of-Field Microscopy," J. Inf. Commun. Converg. Eng 11(2), 139-146, (2013).
47. E. Sánchez-Ortiga, **A. Doblas**, M. Martínez-Corral, G. Saavedra and J. Garcia-Surcerquia, "Aberration compensation for objective phase curvature in phase holographic microscopy: comment," Opt. Lett. 39(3), 417-417 (2013)
48. E. Sánchez-Ortiga, C.J.R. Sheppard, G. Saavedra, M. Martínez-Corral, **A. Doblas** and A. Calatayud, "Subtractive imaging in confocal scanning microscope using a CCD camera as a detector", Optics Letters, 37(7), 1280-1282(2012).
49. E. Sánchez-Ortiga, Pietro Ferraro, M. Martínez-Corral, G. Saavedra and **A. Doblas**, "Digital holographic microscopy with pure-optical spherical phase compensation", J. Opt. Soc. Am. A 28(7), 1410-1417(2011).

Journal Publications under Review/Revision (Undergraduate Student author & Graduate student author)

1. **A. Doblas**, "Digital Holographic Microscopy: Hardware Architecture for Quantitative Phase Imaging," J. Phys. Photonics, *under review* (2026). Invited article in the Focus Issue: Computational Microscopy for Biophotonics.
2. C. Joseph, C. Trujillo, and **A. Doblas**, "Decoupling of Refractive Index and Thickness in Quantitative Phase Imaging using Cauchy Dispersion Modeling," Measurements, *under revision after submitted revisions* (2026).
3. A. Ranjan, A. Shaik, **A. Doblas**, C. Trujillo, E. Banoth, "Sickle Cell Detection on Unprocessed Holograms in Normoxia Conditions Using a Lightweight Attention-based Model," Engineering Applications of Artificial Intelligence, *under revision* (2026).
4. W. Mona, M. J. Gil-Herrera, E. Mazo, D. Cordoba, S. Obando-Vasquez, M. J. Lopera, R. Restrepo, C. Trujillo, **A. Doblas**, and R. Castaneda, "HoloBio: A Holographic Microscopy Tool for Quantitative Biological Analysis," PLOS Computational Biology, *under revision after submitted revisions* (2026).

Journal Publications under Preparation (Undergraduate & Graduate student author)

1. C. Belanger, S. Obando-Vasquez, J. R. Buck, and **A. Doblas**, "Exploiting Hermitian Symmetry in Discrete Fourier Transforms for Spectrum Completion in Super-Resolution," IEEE Signal Processing Letter, *under the last authors' review* (submitted by late May-early June 2026).

CONFERENCE PUBLICATIONS

(Undergraduate Student author & Graduate student author)

1. C. Pereira, M. J. Lopera-Acosta, H. Ottevaere, C. Trujillo, and **A. Doblas**, "Can we increase the imaged field of view by multiplexing several lensless systems using a microlens array?" Proc. SPIE, *under press* (2026).
2. S. Obando-Vasquez, A. Schneider, and **A. Doblas**, "SI-QPI-Stitcher: a user-friendly computational tool to stitch the super-resolved spectral components for accurate quantitative phase imaging (QPI) in digital holographic microscopy (DHM) with structured illumination (SI)," Proc. SPIE 13604, 136060U (2025).

3. S. Obando-Vasquez, R. Restrepo, C. Trujillo, and **A. Doblas**, “Overview of super-resolution techniques suitable for digital holographic microscopy,” Optica Imaging Congress, paper 3W1A.2 (2025).
4. M. Aguiar, C. Trujillo, B. Grassian, A. Lavery, and **A. Doblas**, “Computational algorithm that enables automatic focusing for underwater lensless holographic images,” Optica Imaging Congress, paper 3Tu2A.4 (2025).
5. A. Schneider, S. Obando-Vasquez, and **A. Doblas**, “User-friendly GUI for super-resolved phase imaging from DHM with oblique and structured illumination,” Optica Imaging Congress, paper 3M3A.1 (2025).
6. C. Joseph, and **A. Doblas**, “Separating Sample Thickness and Refractive Index from a Single Phase Maps,” Optica Imaging Congress, paper 3Tu1A.3. (2025).
7. K. Ortega, R. Restrepo, A. Padillo, R. Castaneda, **A. Doblas**, and C. Trujillo, “Fast phase compensation via optical vortex in telecentric digital holographic microscopy,” Optica Imaging Congress, paper 3W1A.3 (2025).
8. S. Obando-Vasquez, R. Restrepo, R. Castaneda, **A. Doblas**, and C. Trujillo "Structured illumination in quantitative super-resolution phase imaging ", Proc. SPIE 13465, 134650N (2025). https://doi.org/10.1117/12.3052486.
9. C. Joseph, and **A. Doblas,** "Review of reported methods to decouple the refractive index and thickness from phase measurements reconstructed using digital holographic microscopy", Proc. SPIE 13465, 1346512 (2025). https://doi.org/10.1117/12.3053223.
10. S. Obando-Vasquez, R. Castaneda, R. Restrepo, C. Trujillo, and **A. Doblas**, “Rapid computational algorithm with minimum user input for reconstructing phase images in structured illumination Digital Holographic Microscopy,” Optica Imaging and Applied Optics Congress, paper DTh5F.4 (2024).
11. S. Obando-Vasquez, R. Restrepo, C. Trujillo, and **A. Doblas**, “Structured illumination digital holographic microscopy via two integrated Mach-Zehnder interferometers,” Optica Imaging and Applied Optics Congress, paper DTh5F.3 (2024).
12. C. Trujillo, L. Thompson, O. Skalli, and **A. Doblas**, “Learning-based model using unpaired datasets for super-resolution microscopy,” Optica Imaging and Applied Optics Congress, paper DTh4H.5 (2024).
13. S. Obando-Vasquez, **A. Doblas**, and C. Trujillo, “Assessment of processing time and measurement accuracy of different phase compensation methods in quantitative phase imaging via Digital Holographic Microscopy applied to biological specimens,” Optica Imaging and Applied Optics Congress, paper DTh4H.3 (2024).
14. **A. Doblas,** B. Bogue-Jimenez, S. Obando-Vasquez, R. Castaneda, and C. Trujillo, “Overview of computational advances in quantitative phase imaging using digital holographic microscopy,” Proc. SPIE 13041, 130410B (2024). doi: 10.1117/12.3011999.
15. B. Bogue-Jimenez, R. Castaneda, C. Trujillo, and **A. Doblas**, “Diatom classification via deep learning using raw holograms captured by a lensless holographic system,” Proc. SPIE 12903, 129030H-7 (2024). doi: 10.1117/12.3001568.
16. R. Castaneda, C. Trujillo, and **A. Doblas**, “Computational algorithm that enables synergetic phase compensation and automatic focusing for off-axis Digital Holographic Microscopy operating in telecentric regime,” Optica Imaging and Applied Optics Congress, paper DTu3A.5 (2023).
17. K. Balachandran, R. Castaneda, **A. Doblas**, “Evaluation of the robustness and accuracy of PCA-based algorithms for in-line Digital Holographic Microscopy,” Optica Imaging and Applied Optics Congress, paper JTu4A.35 (2023).
18. B. Bogue-Jimenez, C. Trujillo, and **A. Doblas**, “An Open-Source Tool for Non-Telecentric Digital Holographic Microscopy Reconstruction,” Optica Imaging and Applied Optics Congress, paper IM3E.1 (2023).

19. S. Obando-Vasquez, **A. Doblas**, and C. Trujillo, "Accurate and fast phase compensation of dynamic samples in Digital Holographic Microscopy," Optica Imaging and Applied Optics Congress, paper HW3C.3 (2023).
20. S. Patra, C. Trujillo, and **A. Doblas**, "Super-resolution in confocal microscopy using generative adversarial networks with paired and unpaired data," Proc. SPIE 12385, 123850S (2023). doi.:10.1117/12.2652629.
21. B. Bogue-Jimenez, C. Trujillo, and **A. Doblas**, "Overview of the automatic reconstruction method for quantitative phase imaging using a digital holographic microscope operating in non-telecentric regime," Proc. SPIE 12389, 123890B (2023). doi.: 10.1117/12.2651944.
22. R. Castaneda, C. Trujillo, and **A. Doblas**, "Concurrent execution of phase compensation and automatic focusing procedures for telecentric off-axis Digital Holographic Microscopy," Proc. SPIE 12389, 123890A (2023). Doi.: 10.1117/12.2652631.
23. C. Hayes-Rounds, R. Isaac, and **A. Doblas**, "Common-path digital holographic microscope using a Fresnel biprism for imaging spatially dense samples," Optica Imaging and Applied Optics Congress, paper 3F3A.3 (2022).
24. R. Castaneda, C. Trujillo, and **A. Doblas**, "An Open-Source Python library for Digital Holographic Microscopy Imaging," Optica Imaging and Applied Optics Congress, paper JTh2A.1 (2022).
25. R. Castaneda, **A. Doblas**, and C. Trujillo "Learning-based Quantitative Phase Imaging in Digital Holographic Microscopy: a comparison study between different models," Optica Imaging and Applied Optics Congress, paper 3F3A.4 (2022).
26. E. Costello, R. E. Williamson, R. Isaac, and **A. Doblas**, "Upgrading the conventional Pepper Ghost holographic device to a full-parallax three-dimensional tunnel display," Optica Imaging and Applied Optics Congress, paper 3F3A.1 (2022).
27. S. Obando-Vasquez, C. Trujillo, and **A. Doblas**, "Turning a commercial bright-field microscope into a precise polarization-sensitive imaging device," Proc. SPIE 12112, 121120E (2022). https://doi.org/10.1117/12.2619052.
28. B. Feng, D. W. Powell, and **A. Doblas**, "Marker-less motion capture system using OpenPose," Proc. SPIE 12101, 121010B (2022). https://doi.org/10.1117/12.2619059.
29. R. Castaneda, C. Trujillo, and **A. Doblas**, "Learning-based method for full phase reconstruction of biological samples in digital holographic microscopy," 2021 IEEE Photonics Conference (IPC) (2021).
30. C. Hayes-Rounds, B. Bogue-Jimenez, J. Garcia-Sucerquia, O. Skalli, and **A. Doblas**, "Assessment of a Fresnel biprism-based digital holographic microscope for fast, high-sensitivity, high-resolution and polarization-sensitive phase imaging," OSA Imaging and Applied Optics Congress, paper 3W5A.2 (2021).
31. R. Castaneda, and **A. Doblas**, "Joint Reconstruction Strategy for Telecentric-based Digital Holographic Microscopes, " OSA Imaging and Applied Optics Congress, paper 3W5A.4 (2021).
32. R. Castaneda, J. Garcia-Sucerquia, and **A. Doblas**, "Synergetic combination of median filtered images to reduce speckle noise in digital holography (DH) and digital holographic microscopy (DHM)," OSA Imaging and Applied Optics Congress, paper DF4C.7 (2021).
33. T. O'Connor, **A. Doblas**, and B. Javidi, "Overview of compact and field-portable system for resolution enhanced digital holographic microscopy by structured illuminarion," OSA Imaging and Applied Optics Congress, paper JTh2A.17, https://doi.org/10.1364/3D.2020.JTh2A.17 (2020).
34. R. Castaneda, C. Buitrago-Duque, J. Garcia-Sucerquia, A. Robinson, and **A. Doblas**, "Fast-iterative blind reconstruction algorithms for accurate quantitative phase images in phase-shifting digital holographic microscopy," OSA Imaging and Applied Optics Congress, paper HTh5D.3, https://doi.org/10.1364/DH.2020.HTh5D.3 (2020).

35. R. Castaneda, T. O'Connor, **A. Doblas**, and B. Javidi, "Reduction in data acquisition for resolution improvement in Structured Illumination Digital Holographic Microscopy," Proc. SPIE 11402, 114020R-8 (2020).
36. A. Doblas, J. Garcia-Sucerquia, G. Saavedra, and M. Martinez-Corral, "Digital holographic microscopy as a screening technology for diabetes," Proc. SPIE 10997, 10997K-7 (2019).
37. S. Bedoya, **A. Doblas**, G. Saavedra and C. Preza, "Wollaston-based tunable frequency structured illumination microscopy," OSA Imaging and Applied Optics congress, paper ITu2B.3, https://doi.org/10.1364/ISA.2018.ITu2B.3 (2018).
38. J. Sola-Pikabea, **A. Doblas**, G. Saavedra, M. Martinez-Corral and C. Preza, "Optimal design of incoherent tunable-frequency structured illumination microscope scheme," *IEEE 15th International Symposium on Biomedical Imaging*, Washington, DC, USA, pp. 449-452(2018).
39. A. Dutta, **A. Doblas**, G. Saavedra, and C. Preza, "Tradeoff between insensitivity to depth-induced spherical aberration and resolution of 3D fluorescence imaging due to the use of wavefront encoding with a radially symmetric phase mask," Proc. SPIE 10499, 1049913-(2018).
40. H. Shabani, **A. Doblas**, G. Saavedra and C. Preza, "Preprocessing method to correct illumination pattern in sinusoidal-based structured illumination microscopy," Proc. SPIE 10499, 1049960- (2018).
41. H. Shabani, **A. Doblas**, G. Saavedra and C. Preza, "3D structured illumination microscopy using an incoherent illumination system based on a Fresnel biprism," Proc. SPIE 10499, 1049902- (2018).
42. G. Saavedra, M. Martinez-Corral, J. Garcia-Sucerquia, E. Sanchez-Ortiga, and A. Doblas, "Recent advances in Digital Holographic Microscopy," IEEE Proceeding, 20th International Conference on Transparent Optical Network ICTON (2018), doi: 10.1109/ICTON.2018.8473628.
43. A. Doblas, H. Shabani, G. Saavedra and C. Preza, "Recent advances in 3D structured illumination microscopy*," IEEE Proceeding, 20th International Conference on Transparent Optical Network ICTON (2018*), doi: 10.1109/ICTON.2018.8473675.
44. N. Patwary, **A. Doblas**, G. Saavedra, and C. Preza, "Evaluation of the use of wavefront encoding to reduce depth-induced aberration in structured illumination microscopy" Proc. SPIE 10499, 1049936- (2018).
45. N. Patwary, C. Preza and **A. Doblas**, "Computational approach to address reduced modulation contrast in structured-illumination microscopy," OSA Imaging and Applied Optics Congress, paper JTu5A.9 (2017), https://doi.org/10.1364/3D.2017.JTu5A.9.
46. A. Doblas, and C. Preza, "Incoherent-based tunable frequency structured illumination microscopy," OSA Imaging and Applied Optics congress, paper ITh4E.4 (2017), https://doi.org/10.1364/ISA.2017.ITh4E.4.
47. H. Shabani, **A. Doblas,** and C. Preza, "Simultaneous optical sectioning and super resolution in 2D-SIM using tunable structured illumination," OSA Imaging and Applied Optics congress, paper CW4B.4 (2017), https://doi.org/10.1364/COSI.2017.CW4B.4.
48. A. Doblas, H. Shabani, G. Saavedra and C. Preza, "Comparison of 3D structured patterns with tunable frequency for use in structured illumination microscopy," Proc. SPIE 10070, 100700H-8 (2017).
49. H. Shabani, N. Patwary, **A. Doblas**, G. Saavedra and C. Preza, "Comparison of two structured illumination techniques based on different 3D illumination pattern," Proc. SPIE 10070, 1007013-8 (2017).
50. S. V. King, C. Taylor, **A. Doblas**, H. Shabani, N. Patwary, G. Saavedra and C. Preza, "Implementation of an incoherent 3-D patterned illumination design in a Structured Illumination Microscopy," Proc. SPIE 1007013, 1007004-7 (2017).

51. A. Doblas, E. Sánchez-Ortiga, G. Saavedra, M. Martínez-Corral, P.-Y. Hsieh and Y.-P. Huang, "Three-dimensional microscopy through liquid-lens axial scanning," Proc. SPIE 9495, 1-6 (2015).
52. A. Doblas, E. Sánchez-Ortiga, M. Martínez-Corral, G. Saavedra and J. Garcia-Surcerquia, "Accurate quantitative image through telecentric digital holographic microscopy," Proc. SPIE 9117, 911705-8 (2014).
53. A. Doblas, S. V. King, N. Patwary, G. Saavedra, M. Martinez-Corral and C. Preza, "Investigation of the SQUBIC phase mask design for depth-invariant widefield microscopy point-spread function engineering," Proc. SPIE 8949-40 (2014).
54. N. Patwary, **A. Doblas**, S. V. King and C. Preza, "Reducing depth induced spherical aberration by wavefront coding in 3D widefield fluorescence microscopy," Proc. SPIE 8949-37 (2014).
55. S. V. King, **A. Doblas**, N. Patwary, G. Saavedra, M. Martínez-Corral and C. Preza, "Implementation of PSF engineering in high-resolution 3D microscopy imaging with a LCOS (reflective) SLM," Proc. SPIE 8949-39 (2014).
56. E. Sánchez-Ortiga, **A. Doblas**, G. Saavedra and M. Martínez-Corral, "Novel proposal in widefield 3D microscopy", Proc. SPIE 7690, 7690.05 (2010).
57. G. Saavedra, E. Sánchez-Ortiga, M. Martínez-Corral, A. Doblas and P. Ferraro, "Optically-undistorted digital holographic microscopy for quantitative phase-contrast imaging", *IEEE Workshop on Information Optics (WIO), 10th Euro-American Workshop* (2010). doi 10.1109/WIO.2011.5981444.
58. E. Sánchez-Ortiga, G. Saavedra, M. Martínez-Corral, A. Doblas and A. Calatayud, "Confocal scanning microscope using CCD camera as a pinhole-detector system", *IEEE Workshop on Information Optics (WIO), 10th Euro-American Workshop* (2010). doi 10.1109/WIO.2011.5981473.
59. G. Saavedra, M. Martínez-Corral, E. Sánchez-Ortiga and A. Doblas, "Optical-sectioning microscopy by patterned illumination," J. Phys.: Conf. Series 206 (2010) 012011.

PRESENTATIONS

Invited Presentations

1. "Digital Holographic Microscopy 101 – Bringing Quantitative Phase Imaging to the community," *Invited Seminar presented* at the Department of Physics, Photonics and Optical Engineering, Bridgewater (MA), April 14, 2026.
2. "Making advances in optical microscopic imaging accessible to our community: the mission of the Optical Imaging Research Laboratory," *Invited Seminar* presented at the Department of Mechanical Engineering in Stony Brook University, Stony Brook (NY), November 21, 2025.
3. "Overview DL models to enhance imaging infrastructure," *Invited Talk at the Faculty of Sciences – University of Alicante,* Alicante (Spain), July 25, 2024.
4. "What is Digital Holographic Microscopy (DHM)? State of the art and applications," *Plenary Talk at the XIV Spanish National Meeting of Optics*, Murcia (Spain), July 3, 2024.
5. "What is Digital Holographic Microscopy (DHM)? What is the state of the art? How can DHM be applied to Marine Environment research," *Invited Seminar presented at Woods Hole Oceanographic Institution (WHOI)*, Falmouth (MA), January 17, 2024.
6. "Roadmap on digital holographic microscopy from hardware to computational methods," *Invited Lecture presented at Biomedical Research Seminar - the Old Dominion University*, online October 21, 2022.
7. "Roadmap to the next generation of Digital Holographic Microscopes," *Invited Talk presented at the Southeast Symposium on Contemporary Engineering Topics*, October 14, 2022.

8. “Advances in super-resolution fluorescence microscopy through a novel tunable 3D structured illumination design”, *Invited Lecture presented at the University of Georgia*, online May 15, 2020.
9. “Overview of Digital Holographic Microscopy”, *Invited Lecture presented at Fall UofM Physics Seminar, University of Memphis, Department of Physics,* November 19, 2021.
10. “Advances in super-resolution fluorescence microscopy through a novel tunable 3D structured illumination design”, *Invited Lecture presented at the University of Georgia*, online May 15, 2020.
11. “Advances in super-resolution fluorescence microscopy through a novel tunable 3D structured illumination design”, *Invited Lecture presented at Spring UofM Physics Seminar, University of Memphis, Department of Physics,* February 1, 2019.
12. “Structured Illumination Microscopy”, *Invited Lecture presented at the Department of Electrical and Computer Engineering at the University of Memphis*, Memphis, TN, March 31, 2016.
13. “Advances in high-resolution optical microscopy”, *Invited Lecture presented at the Department of Electrical and Computer Engineering at the University of Memphis*, Memphis, TN, August 8, 2016.

Conference Presentations/Posters (Undergraduate & Graduate student author)

1. S. Obando-Vasquez, and **A. Doblas**, “Design and Implementation of a Super-Resolution Dual-Mode Microscope for Intensity and Quantitative Phase Imaging Tunable Across Multiple Objective Lenses,” *Invited Talk* presented at the European Optical Society Annual Meeting (EOSAM) within the session of Frontiers of Optical Metrology, Tampere (Finland), August 24-28, 2026.
2. **A. Doblas**, “Engineering light for discovery: emerging directions from the Optical Imaging Research Lab (OIRL),” *Invited Talk* presented at the Three-Dimensional Imaging, Visualization, and Display 2026 conference at the SPIE Defense + Security’26, National Harbor (MD), April 27, 2026.
3. C. Pereira, M. J. Lopera-Acosta, H. Ottevaere, C. Trujillo, and **A. Doblas**, “Can we increase the imaged field of view by multiplexing several lensless systems using a microlens array?” Poster in SPIE Defense + Security, National Harbor (MD), April 28, 2026.
4. C. Belanger, S. Obando-Vasquez, **A. Doblas**, and J. Buck, “Reduction in data acquisition for lateral resolution improvement in fluorescence microscopy imaging,” Poster in SPIE Defense + Security, National Harbor (MD), April 28, 2026.
5. S. Obando-Vasquez, K. Ortiga-Sanchez, R. Restrepo, and **A. Doblas**, “How to turn a low-cost confocal microscope into a super-resolution system,” Poster in SPIE Defense + Security, National Harbor (MD), April 28, 2026.
6. **A. Doblas**, “Socratic AI Tutoring in Signals and Systems: A Classroom Work-in-Progress Study,” 2026 IEEE Integrated STEM Education Conference, Princeton University (NJ), March 14 2026.
7. M. Aguiar, C. Trujillo, B. Grassian, A. Lavery, and **A. Doblas**, “Computational algorithm that enables automatic focusing for underwater lensless holographic images,” *Oral Talk* in Optica Imaging and Applied Optics Congress, Seattle (US), August 18-21, 2025.
8. A. Schneider, S. Obando-Vasquez, and **A. Doblas**, “User-friendly GUI for Super-Resolved Phase Imaging from DHM with oblique and structured illumination,” *accepted Oral Talk* in Optica Imaging and Applied Optics Congress, Seattle (US), August 18-21, 2025.
9. C. Joseph, and **A. Doblas**, “Separating Sample Thickness and Refractive Index from a Single Phase Map,” *Oral Talk* in Optica Imaging and Applied Optics Congress, Seattle (US), August 18-21, 2025.

10. S. Obando-Vasquez, R. Restrepo, C. Trujillo, and **A. Doblas**, “Overview of super-resolution techniques suitable for digital holographic microscopy,” *Oral Talk* in Optica Imaging and Applied Optics Congress, Seattle (US), August 18-21, 2025.
11. M. Aguiar, B. Grassian, C. Trujillo, A. Lavery, and **A. Doblas**, “Investigation of a robust focusing metric for focusing microorganisms in underwater lensless imaging,” Poster in the Optics and Photonics for Information Processing XIX Conference, SPIE Optics + Photonics, San Diego (CA), August 4, 2025.
12. S. Obando-Vasquez, A. Schneider, and A. Doblas, “SI-QPI-stitcher: a user-friendly computational tool to stitch the super-resolved spectral components for accurate QPI in DHM with structured illumination,” Poster in the Optics and Photonics for Information Processing XIX Conference, SPIE Optics + Photonics, San Diego (CA), August 4, 2025.
13. C. Joseph, and A. Doblas, “Can we decouple the refractive index and thickness from a 2D reconstructed phase map using a computational framework and a single image?,” Oral Talk in the Optics and Photonics for Information Processing XIX Conference, SPIE Optics + Photonics, San Diego (CA), August 6, 2025.
14. S. Obando-Vasquez, J. Goncalves, and A. Doblas, “Designing a low-cost confocal microscope with super-resolution capability and enhanced speed and efficiency,” Oral Talk in the Optics and Photonics for Information Processing XIX Conference, SPIE Optics + Photonics, San Diego (CA), August 6, 2025.
15. S. Obando-Vasquez, R. Restrepo, R. Castaneda, **A. Doblas**, and C. Trujillo "Structured illumination in quantitative super-resolution phase imaging ", Invited Talk in the Three-Dimensional Imaging, Visualization, and Display 2025 Conference, SPIE Defense + Commercial Sensing, Orlando (FL), April 16, 2025.
16. C. Joseph, and **A. Doblas,** "Review of reported methods to decouple the refractive index and thickness from phase measurements reconstructed using digital holographic microscopy", Poster in the Three-Dimensional Imaging, Visualization, and Display 2025 Conference, SPIE Defense + Commercial Sensing, Orlando (FL), April 15, 2025.
17. S. Obando-Vasquez, R. Castaneda, R. Restrepo, C. Trujillo, and **A. Doblas**, “Rapid computational algorithm with minimum user input for reconstructing phase images in structured illumination Digital Holographic Microscopy,” Oral Talk in the 3D Image Acquisition and Display: Technology, Perception and Applications, Optica Imaging and Applied Optics Congress, Toulouse (France), July 15-19, 2024.S. Obando-Vasquez, R. Restrepo, C. Trujillo, and **A. Doblas**, “Structured illumination digital holographic microscopy via two integrated Mach-Zehnder interferometers,” Oral Talk in the 3D Image Acquisition and Display: Technology, Perception and Applications, Optica Imaging and Applied Optics Congress, Toulouse (France), July 15-19, 2024.
18. C. Trujillo, L. Thompson, O. Skalli, and **A. Doblas**, “Learning-based model using unpaired datasets for super-resolution microscopy,” Oral Talk in the 3D Image Acquisition and Display: Technology, Perception and Applications, Optica Imaging and Applied Optics Congress, Toulouse (France), July 15-19, 2024.
19. S. Obando-Vasquez, **A. Doblas**, and C. Trujillo, “Assessment of processing time and measurement accuracy of different phase compensation methods in quantitative phase imaging via Digital Holographic Microscopy applied to biological specimens,” Oral Talk in the 3D Image Acquisition and Display: Technology, Perception and Applications, Optica Imaging and Applied Optics Congress, Toulouse (France), July 15-19, 2024.
20. A. Doblas, B. Bogue-Jimenez, S. Obando-Vasquez, R. Castaneda, and C. Trujillo, “Overview of computational advances in Quantitative Phase Imaging using Digital Holographic Microscopy,” Invited Talk in the Three-Dimensional Imaging, Visualization, and Display 2024 Conference, SPIE Defense + Commercial Sensing, National Harbor (MD), April 23, 2024.
21. A. Doblas, and C. Trujillo, “Overview of Learning-based models to enhance the imaging infrastructure,” Invited Talk in SPIE Photonics West ’24, January 2024.

22. B. Bogue-Jimenez, C. Trujillo, and **A. Doblas**, "Diatom Classification via Deep Learning using Raw Holograms Captured by a Lensless Holographic System," Oral Talk in SPIE Photonics West '24, January 2024.
23. A. Doblas, S. Patra, R. Castaneda, and C. Trujillo, "Applications of deep learning in microscopic imaging," Invited Talk in the European Summit on Laser Optics & Photonics Technology' 23, September 23.
24. R. Castaneda, C. Trujillo, and **A. Doblas**, Computational algorithm that enables synergetic phase compensation and automatic focusing for off-axis Digital Holographic Microscopy operating in telecentric regime," Oral Talk in Optica Imaging and Applied Optics Congress '23, August 2023.
25. K. Balachandran, R. Castaneda, **A. Doblas**, "Evaluation of the robustness and accuracy of PCA-based algorithms for in-line Digital Holographic Microscopy," Poster in Optica Imaging and Applied Optics Congress '23, August 2023.
26. B. Bogue-Jimenez, C. Trujillo, and **A. Doblas**, "An Open-Source Tool for Non-Telecentric Digital Holographic Microscopy Reconstruction," Oral Talk in Optica Imaging and Applied Optics Congress' 23, August 2023.
27. S. Obando-Vasquez, **A. Doblas**, and C. Trujillo, "Accurate and fast phase compensation of dynamic samples in Digital Holographic Microscopy," Oral Talk in Optica Imaging and Applied Optics Congress' 23, August (2023).
28. S. Patra, C. Trujillo, and **A. Doblas**, "Super-resolution in confocal microscopy using generative adversarial networks with paired and unpaired data," Oral Talk in SPIE Photonics West '23, February 2023.
29. B. Bogue-Jimenez, C. Trujillo, and **A. Doblas**, "Overview of the automatic reconstruction method for quantitative phase imaging using a digital holographic microscope operating in non-telecentric regime," Oral Talk in SPIE Photonics West '23, February 2023.
30. R. Castaneda, C. Trujillo, and **A. Doblas**, "Concurrent execution of phase compensation and automatic focusing procedures for telecentric off-axis Digital Holographic Microscopy," Oral Talk in SPIE Photonics West '23, February 2023.
31. C. Hayes-Rounds, R. Isaac, and **A. Doblas**, "Common-path digital holographic microscope using a Fresnel biprism for imaging spatially dense samples," Oral Talk in Optica Imaging and Applied Optics Congress, July 2022.
32. R. Castaneda, C. Trujillo, and **A. Doblas**, "An Open-Source Python library for Digital Holographic Microscopy Imaging," Poster in Optica Imaging and Applied Optics Congress, July 2022.
33. R. Castaneda, **A. Doblas**, and C. Trujillo "Learning-based Quantitative Phase Imaging in Digital Holographic Microscopy: a comparison study between different models," Oral Talk in Optica Imaging and Applied Optics Congress, July 2022.
34. E. Costello, R. E. Williamson, R. Isaac, and **A. Doblas**, "Upgrading the conventional Pepper Ghost holographic device to a full-parallax three-dimensional tunnel display," Oral Talk in *Optica Imaging and Applied Optics Congress, July 2022.*
35. B. Bogue-Jimenez, D. Powell, X. Huang, and **A. Doblas**, "Exploring Non-invasive solutions for continuous glucose monitoring," Oral Talk in SPIE Meeting on Defense, Security & Sensing '22, April 2022.
36. R. Castaneda, C. Trujillo, and **A. Doblas**, "Learning-based free-of-distortion phase imaging," Oral Talk in SPIE Meeting on Defense, Security & Sensing '22, April 2022.
37. B. Feng, and **A. Doblas**, "Marker-less Motion Capture System using OpenPose," Oral Talk in SPIE Meeting on Defense, Security & Sensing '22, April 2022.
38. S. Obando-Vasquez, C. Trujillo, and **A. Doblas**, "Turning a commercial bright-field microscope into a precise polarization-sensitive imaging device," Oral Talk in SPIE Meeting on Defense, Security & Sensing '22, April 2022.

39. B. Feng, and **A. Doblas**, "Marker-less Motion Capture System using OpenPose," Oral Talk in 2022 Mid-South Biomechanics Conference, February 2022.
40. B. Bogue-Jimenez, X. Huang, D. Powell, and **A. Doblas**, "Multisensory Non-invasive approach for Continuous Glucose Monitoring," Oral Talk in 2022 Mid-South Biomechanics Conference, February 2022.
41. R. Castaneda, C. Trujillo, and **A. Doblas**, "Learning-based method for full phase reconstruction of biological samples in digital holographic microscopy," 2021 IEEE Photonics Conference, October 2021.
42. C. Hayes-Rounds, B. Bogue-Jimenez, J. Garcia-Sucerquia, O. Skalli, and **A. Doblas**, " Assessment of a Fresnel biprism-based digital holographic microscope for fast, high-sensitivity, high-resolution and polarization-sensitive phase imaging," OSA Imaging and Applied Optics Congress, July 2021
43. R. Castaneda, and **A. Doblas**, "Joint Reconstruction Strategy for Telecentric-based Digital Holographic Microscopes, " OSA Imaging and Applied Optics Congress, July 2021.
44. R. Castaneda, J. Garcia-Sucerquia, and **A. Doblas**, "Synergetic combination of median filtered images to reduce speckle noise in digital holography (DH) and digital holographic microscopy (DHM)," OSA Imaging and Applied Optics Congress, July 2021.
45. T. O'Connor, **A. Doblas,** and B. Javidi, "Overview of structured illumination for resolution enhancement in compact and field-portable 3D-printed shearing digital holographic microscopy," *OSA Imaging and Applied Optics Conference '20*, June 2020.
46. R. Castaneda, C. Buitrago, J. Garcia-Sucerquia, A. Robinson, and **A. Doblas**, "Fast-iterative blind reconstruction algorithms for accurate quantitative phase images in phase-shifting digital holographic microscopy," *OSA Imaging and Applied Optics Conference '20*, June 2020.
47. A. Doblas, "Quantitative Phase Imaging as an alternative screening and monitoring method for diabetes," *Invited Talk* in Frontiers in Lasers, Optics and Photonics '20, March 2020.
48. T. O'Connor, **A. Doblas**, and B. Javidi, "Overview of structured illumination for resolution enhancement in compact and field-portable 3D-printed shearing digital holographic microscopy," SPIE Meeting on Defense, Security & Sensing '20, April 2020.
49. A. Doblas, A. Robinson, C. Buitrago-Duque, and J. Garcia-Sucerquia, "Blind Phase-Shifting Digital Holographic Microscopy using an iterative approach," *Invited Talk in SPIE Meeting on Defense, Security & Sensing '20*, April 2020.
50. C. Hayes-Round, B. Bogue-Jimenez, J. Garcia-Sucerquia, O. Skalli, and **A. Doblas**, "Polarization-sensitive digital holographic microscopy using a Fresnel biprism," *SPIE Meeting on Defense, Security & Sensing '20*, April 2020.
51. R. Castaneda, **A. Doblas**, T. O'Connor, and B. Javidi, "Reduction in data acquisition for resolution improvement in Structured Illumination Digital Holographic Microscopy," *SPIE Meeting on Defense, Security & Sensing '20*, Anaheim (USA), April 2020.
52. A. Doblas, S. Bedoya, and C. Preza, "Tunable-frequency two-dimensional Wollaston prism-based structured illumination microscope," *Invited Talk in* Frontiers in Lasers, Optics and Photonics '19, Tokyo (Japan), May 2019.
53. A. Doblas, J. Garcia-Sucerquia, G. Saavedra, and M. Martinez-Corral, "Digital holographic microscopy as a screening technology for diabetes," *Invited Talk in SPIE Meeting on Defense, Security & Sensing '19*, Baltimore (USA), April 2019.
54. H. Shabani, **A. Doblas**, G. Saavedra, and C. Preza, "Investigating the impact of structured illumination design on the synthetic optical transfer function," *BiOS 2019, part of Photonics West*, San Francisco (USA), February 2019.
55. J. Sola-Pikabea, **A. Doblas**, G. Saavedra, M. Martinez-Corral and C. Preza, "Optimal design of an incoherent structured illumination system with tunable frequency," *XII Spanish Optical Society Meeting*, Castellon (Spain), July 2018.

56. G. Saavedra, M. Martinez-Corral, J. Garcia-Sucerquia, E. Sanchez-Ortiga, and **A. Doblas**, "Recent advances in Digital Holographic Microscopy," *20th International Conference on Transparent Optical Networks*, Bucharest (Romania), July 2018.
57. A. Doblas, H. Shabani, G. Saavedra and C. Preza, "Recent advances in 3D structured illumination microscopy," *20th International Conference on Transparent Optical Networks*, Bucharest (Romania), July 2018.
58. S. Bedoya, **A. Doblas**, G. Saavedra and C. Preza, "Wollaston-based tunable frequency structured illumination microscopy," *Imaging systems and Applications*, part of *OSA Imaging and Applied Optics congress*, Orlando (USA), June 2018.
59. S. Bedoya, **A. Doblas**, G. Saavedra and C. Preza, "Tunable structured illumination system based on a Wollaston prism" *Image Science Gordon Research Conference*, Easton (USA), June 2018.
60. H. Shabani, **A. Doblas**, G. Saavedra and C. Preza, "Novel structured illumination improves 3-D resolution in fluorescence microscopy" *Image Science Gordon Research Conference*, Easton (USA), June 2018.
61. H. Shabani, **A. Doblas**, G. Saavedra and C. Preza, "3D Tunable Structured Illumination Microscope using a Fresnel biprism," *Focus on Microscopy 2018*, Singapur (Singapur), March 2018.
62. A. Doblas, J. Sola-Pikabea, H. Shabani, G. Saavedra, M. Martinez-Corral and C. Preza, "Incoherent structured illumination system with a tunable 3D pattern," *Computational Imaging III*, part of *SPIE DCS Commercial + Scientific Sensing and Imaging*, Orlando (USA), April 2018.
63. J. Sola-Pikabea, **A. Doblas**, G. Saavedra, M. Martinez-Corral and C. Preza, "Optimal design of incoherent tunable-frequency structured illumination microscope scheme," IEE International Symposium on Biomedical Imaging, Washington D. C. (USA), April 2018.
64. A. Dutta, **A. Doblas**, G. Saavedra, and C. Preza, "Tradeoff between insensitivity to depth-induced spherical aberration and resolution of 3D fluorescence imaging due to the use of wavefront encoding with a radially symmetric phase mask," *BiOS 2018, part of Photonics West*, San Francisco (USA), January-February 2018.
65. H. Shabani, **A. Doblas**, G. Saavedra and C. Preza, "Preprocessing method to correct illumination pattern in sinusoidal-based structured illumination microscopy," *BiOS 2018, part of Photonics West*, San Francisco (USA), January-February 2018.
66. H. Shabani, **A. Doblas**, G. Saavedra and C. Preza, "3D structured illumination microscopy using an incoherent illumination system based on a Fresnel biprism," *BiOS 2018, part of Photonics West*, San Francisco (USA), January-February 2018.
67. N. Patwary, A**. Doblas**, G. Saavedra, and C. Preza, "Evaluation of the use of wavefront encoding to reduce depth-induced aberration in structured illumination microscopy" *BiOS 2018, part of Photonics West*, San Francisco (USA), January-February 2018.
68. A. Doblas and C. Preza, "Incoherent-based tunable frequency structured illumination microscopy," *Imaging systems and Applications*, part of *OSA Imaging and Applied Optics congress*, San Francisco (USA), June 2017.
69. N. Patwary, C. Preza and **A. Doblas**, "Computational approach to address reduced modulation contrast in structured-illumination microscopy," OSA Imaging and Applied Optics congress, paper JTu5A.9 (2017), https://doi.org/10.1364/3D.2017.JTu5A.9.
70. H. Shabani, **A. Doblas** and C. Preza, "Simultaneous optical sectioning and super resolution in 2D-SIM using tunable structured illumination," OSA Imaging and Applied Optics congress, paper CW4B.4 (2017), https://doi.org/10.1364/COSI.2017.CW4B.4.
71. A. Doblas, J. Garcia-Sucerquia, C. Trujillo, G. Saavedra, and M. Martinez-Corral, "Phase-shifting method applied to digital holographic microscopy using a programmable focusing lens," *Focus on Microscopy 2017*, Bordeaux (France), April 2017.

72. C. Preza, N. Patwary, H. Shabani, **A. Doblas** and G. Saavedra, "PSF Engineering using a fabricated Squbic phase mask to reduce the effect of spherical aberration in 3D widefield field fluorescence imaging," *Focus on Microscopy 2017*, Bourdeaux (France), April 2017.
73. A. Doblas, H. Shabani, G. Saavedra and C. Preza, "Improvement of 2D-SIM achieved based on tunable structured illumination," *Focus on Microscopy 2017*, Bordeaux (France), April 2017.
74. J. Barrick, **A. Doblas**, M. Gardner, P. R. Sears, L. E. Ostrowski and A. L. Oldenburg, "Supercontinuum parallel line-field optical coherence tomography for high sensitivity, kilohertz frame rate imaging," *Optics in Life Science 2017, part of Bio-Optics: Design and Application 2017,* San Diego (USA), April 2017. https://doi.org/10.1364/BODA.2017.BoM4A.1.
75. A. Doblas, G. Saavedra, and C. Preza, "Comparison of 3D structured patterns with tunable frequency for use in Structured Illumination Microscopy" *BiOS 2017, part of Photonics West*, San Francisco (USA), January-February 2017.
76. A. Doblas, E. Boyers, R. L. Blackmon, and A. L. Oldenburg, "Investigation of spectrometer design for reducing roll-off in spectral-domain optical coherence tomography," *BiOS 2017, part of Photonics West*, San Francisco (USA), January-February 2017.
77. J. Barrick, **A. Doblas**, P. R. Sears, L. E. Ostrowski, and A. L. Oldenburg, "High-sensitivity supercontinuum-based parallel line-field optical coherence tomography with 1 million A-lines/s," *BiOS 2017, part of Photonics West*, San Francisco (USA), January-February 2017.
78. S. V. King, C. Taylor, **A. Doblas**, H. Shabani, N. Patwary, G. Saavedra, and C. Preza, "Implementation of an incoherent 3-D patterned illumination design in Structured Illumination Microscope," *BiOS 2017, part of Photonics West*, San Francisco (USA), January-February 2017.
79. H. Shabani, N. Patwary, **A. Doblas**, G. Saavedra, and C. Preza, "Investigating the effect of different 3D illumination patterns on structured illumination microscopy performance," *Quantitative BioImaging Conference* '17, College Station (Texas, US), January 2017.
80. N. Patwary, **A. Doblas**, G. Saavedra, and C. Preza, "Implementation of PSF engineering using a fabricated SQUBIC phase mask to reduce the effect of spherical aberration in 3D wide field fluorescence imaging," *Quantitative BioImaging Conference* '17, College Station (Texas, US), January 2017.
81. M. Martinez-Corral, **A. Doblas**, E. Sanchez-Ortiga, G. Saavedra, and Y.P. Huang, "Fast axial scanning in 3D imaging," *Imaging and Applied Optics Congress* '16, Heidelberg, (Germany), July 2016.
82. A. Doblas, E. Sánchez-Ortiga, G. Saavedra, J. Sola-Pikabea, M. Martínez-Corral, P. Y. Hsieh and Y. P. Huang, "Three-dimensional microscopy through liquid-lens axial scanning," *SPIE Meeting on Defense, Security & Sensing '15*, Baltimore (USA), May 2015.
83. A. Doblas, G. Saavedra, M. Martínez-Corral, J. Garcia-Sucerquia, E. Roche and F. J. Ampudia-Blasco "Evaluation of digital holographic microscope as an alternative method to the diagnosis and screeing of HbA_{1c} in diabetic patients," *XXVI National Meeting on Diabetes (SED)*, Valencia (Spain), April 2015.
84. A. Doblas, E. Roche, F. J. Ampudia-Blasco, G. Saavedra, M. Martínez-Corral and J. Garcia-Sucerquia, "Assessment of diabetes screening using quantitative phase imaging by digital holographic microscopy," *Focus on Microscopy 2015*, Göttingen (Germany), March 2015.
85. E. Sánchez-Ortiga, **A. Doblas**, J. Sola-Pikabea, G. Saavedra, P. Y. Hsieh, Y. P. Huang and M. Martínez-Corral, "Non-mechanical axial scanning in wide-field microscopy by means of a liquid lens," *Focus on Microscopy 2015,* Göttingen (Germany), March 2015.
86. A. Doblas, E. Sánchez-Ortiga, M. Martínez-Corral, G. Saavedra and J. Garcia-Sucerquia, "Drawbacks of using non-telecentric geometry in digital holographic microscopy", *Focus Latin America 2014,* Medellín (Colombia), November 2014.

87. A. Doblas, A. Pons, G. Saavedra and M. Martínez-Corral, “Ultra-fast axial-scanning microscopy by use of a liquid lens,” *XXIII ICO ’14*, Santiago de Compostela (Spain) August 2014.
88. M. Martínez-Corral, **A. Doblas**, E. Sánchez-Ortiga, G. Saavedra and J. Garcia-Sucerquia, “Accurate quantitative phase imaging through telecentric digital holographic microscopy,” *SPIE Meeting on Defense, Security & Sensing ’14*, Baltimore (USA), May 2014.
89. C. Preza, N. Patwary, **A. Doblas**, S. V. King, G. Saavedra and M. Martínez-Corral, “Addressing depth-induced spherical aberration in computational optical sectioning microscopy using wavefront coding”, *Focus on Microscopy 2014*, Sidney (Australia), April 2014.
90. A. Doblas, S. V. King, N. Patwary, G. Saavedra, M. Martinez-Corral and C. Preza, “Investigation of the SQUBIC phase mask design for depth-invariant widefield microscopy point-spread function engineering,” *BiOS 2014, part of Photonics West*, San Francisco (USA), February 2014.
91. N. Patwary, **A. Doblas**, S. V. King and C. Preza, “Reducing depth induced spherical aberration by wavefront coding in 3D widefield fluorescence microscopy,” *BiOS 2014, part of Photonics West*, San Francisco (USA) February 2014.
92. S. V. King, **A. Doblas**, N. Patwary, G. Saavedra, M. Martínez-Corral and C. Preza, “Implementation of PSF engineering in high-resolution 3D microscopy imaging with a LCOS (reflective) SLM,” *BiOS 2014, part of Photonics West*, San Francisco (USA), February 2014.
93. J. Garcia-Sucerquia, E. Sánchez-Ortiga, **A. Doblas**, M. Martínez-Corral, G. Saavedra and P. Andrés, “Curvature phase factor in digital holographic microscopy”, *XI Latinoamerican Meeting on Optics, Lasers and Applications*, Porto (Portugal), July 2013.
94. A. Doblas, E. Sánchez-Ortiga, M. Martínez-Corral, G. Saavedra, P. Andrés and J. Garcia-Sucerquia, “Efecto del telecentrismo en microscopía holográfica digital”, *XXXIV Reunión Bienal de la Real Sociedad Española de Física*, Valencia (Spain), July 2013.
95. E. Sánchez-Ortiga, **A. Doblas**, J. Garcia-Sucerquia, M. Martínez-Corral and G. Saavedra, “Microscopía holográfica digital: optimización de los parámetros de captura”, *XXXIV Reunión Bienal de la Real Sociedad Española de Física*, Valencia (Spain), July 2013.
96. E. Sánchez-Ortiga, **A. Doblas**, M. Martínez-Corral, G. Saavedra and J. Garcia-Sucerquia, “DHM parameters for optimal hologram recording”, *Focus on Microscopy 2013*, Maastricht (Netherlands), March 2013.
97. A. Doblas, E. Sánchez-Ortiga, M. Martínez-Corral, G. Saavedra and J. Garcia-Sucerquia, “Effect of non-telecentric geometry in quantitative phase imaging by digital holographic microscopy”, *Focus on Microscopy 2013*, Maastricht (Netherlands), March 2013.
98. A. Doblas, G. Saavedra, J. Barreiro, M. Martínez-Corral, E. Sánchez-Ortiga, A. Pons and A. Llavador, “Lau effect with a Fresnel biprism”, *X Spanish Optical Society Meeting*, Zaragoza (Spain), September 2012.
99. E. Sánchez-Ortiga, C. Sheppard, G. Saavedra, **A. Doblas**, G. Saavedra, M. Martínez-Corral and P. Andrés, “Confocal scanning microscopy with spatial sampling at the detector plane”, *X Spanish Optical Society Meeting*, Zaragoza (Spain), September 2012.
100. G. Saavedra, M. Martínez-Corral, **A. Doblas**, E. Sánchez-Ortiga, J.C. Barreiro and A. Llavador, “Tunable structured illumination microscopy with incoherent light”, *Focus on Microscopy 2012*, Singapur (Singapur) April 2012.
101. G. Saavedra, M. Martínez-Corral, **A. Doblas** and E. Sánchez-Ortiga, “Versatile fringe generation for 3D imaging in microscopy”, *5th International Universal Communication Symposium*, Gumi (South Korea), October 2011.
102. G. Saavedra, E. Sánchez-Ortiga, M. Martínez-Corral, A. Doblas and P. Ferraro, “Optically-undistorted digital holographic for quantitative phase-contrast imaging”, *10th Workshop on Information Optics*, Benicasssim (Spain), Juny 2011.

103. E. Sánchez-Ortiga, G. Saavedra, M. Martínez-Corral, **A. Doblas** and A. Calatayud, "Confocal scanning microscope using CCD camera as a pinhole-detector system", *10th Workshop on Information Optics*, Benicasssim (Spain), Juny 2011.
104. E. Sánchez-Ortiga, P. Ferraro, M. Martínez-Corral, G. Saavedra and **A. Doblas**, "Telecentric DHM for quantitative phase-contrast imaging", *Focus on Microscopy 2011*, Konstanz (Germany), April 2011.
105. H. Navarro, M. Martínez-Corral, B. Javidi, E. Sánchez-Ortiga, **A. Doblas** and G. Saavedra, "Axial Segmentation of 3D images through synthetic-apodization integral-imaging microscopy", *Focus on Microscopy 2011*, Konstanz (Germany), April 2011.
106. E. Sánchez-Ortiga, **A. Doblas**, G. Saavedra and M. Martínez-Corral, "Novel proposals in widefield 3D microscopy", *SPIE Meeting on Defense, Security & Sensing '10*, Orlando (EEUU), April 2010.
107. M. Martínez-Corral, G. Saavedra, A. Pons, R. Martinez Cuenca, I. Escobar, H. Navarro, A. Molina, A, Tolosa, E. Sánchez-Ortiga and **A. Doblas**, "Activities in 3D Imaging & Display Laboratory of University of Valencia", *IX National Meeting on Optics*, Ourense (Spain), September 2009.
108. M. Martínez-Corral, G. Saavedra, E. Sánchez Ortiga and A. Doblas, "Optical-sectioning microscopy by patterned illumination", *8th Workshop on Information Optics*, Paris (France), July 2009.

OUTREACH

- **Open Educational Resource - OER Commons and LibreText** December 2024
  https://oercommons.org/courseware/lesson/123811
  https://phys.libretexts.org/Courses/University_of_Massachusetts_Dartmouth/Intro_to_Optics_and_Photonics
- **Summer Intership for High School Students – UMass Dartmouth** August 2024 - present
  Dr. Doblas has partnered with Dr. Ferreira to host two groups of local high school students in the OIRL lab during two weeks in summer. Throughout the week, students gain practical skills in experimental optics, data analysis, and theoretical comparison, enhancing their understanding of refraction, total internal reflection, polarization, and diffraction.
- **STEM4Girls Workshop – UMass Dartmouth** October 2023 – present
  Workshops: Playing with optics and light,
- **Dissertation Writers Retreat – Camp 3 at the University of Memphis** January 2023
  Workshop: Literature review research in STEM
- **NEDtalk Presenter at the University of Memphis** November 2022
  Title: What is a DHM microscope, and which is its current state of art?
- **Partnership – Pink Palace Museum** 2020 – present
  Initiated and leading collaboration with Alex Eilers from Pink Palace Museum by developing outreach activities such as a laser maze demonstration and a senior project, which was a 3D hologram, that was displayed from the first week of December until October 2021, having positive feedback from the audience.
- **STEM club at the Lausanne Collegiate School** 2021 – present
  Initiated and leading collaboration with Subash Gautam from Lausanne Collegiate School by developing research activities for high-school students. This activity is part of my NSF CAREER project.
- **OIRL GitHub** 2021 – present
  Leading OIRL GitHub by uploading developed computational algorithms for general use to promote open-access research codes in *Optical Engineering*.
  CIPHER: https://github.com/OIRL/CIPHER

HoloBio: https://github.com/SOPHIA-Research-Lab/HoloBio
Open SRQPI: https://github.com/OIRL/OpenSRQPI
3D QPI-DHM: https://sites.google.com/view/3dqpidhm/home
Semi-heuristic phase compensation: https://sobandov.github.io/SHPC/
Non-tele DHM tool: https://github.com/OIRL/noteleDHM-Tool
https://sites.google.com/view/noteledhmtool/home?authuser=0&pli=1
pyDHM library: https://catrujilla.github.io/pyDHM/
Blind PS-DHM methods: https://oirl.github.io/Blind-PS-DHM-methods/
tuDHM method: https://oirl.github.io/tuDHM/
Hybrid Median Mean Filter (HM2F): https://oirl.github.io/Speckle-Hybrid-median-mean/
cGAN model for QPI-DHM: https://oirl.github.io/cGAN-Digital-Holographic-microscopy/
Open-access tool for Phase Compensation Reconstruction Method in Digital Holographic Microscopy Operating in Non-Telecentric Regime
https://sites.google.com/view/noteledhmtool/home?authuser=1
https://github.com/OIRL/noteleDHM-Tool
Semi-heuristic phase compensation algorithm: https://sobandov.github.io/SHPC/
Synergistic reconstruction framework to generate in-focus quantitative phase images from defocused off-axis holograms
https://github.com/OIRL/3D-QPI-DHM/
https://sites.google.com/view/3dqpidhm/home
REU – Olive Oil Classification
https://sites.google.com/view/reu-olive-oil-classification/home
https://github.com/OIRL/REU-OliveOilClassification/tree/main
REU – PCA-based algorithm for in-line DHM system
https://sites.google.com/view/pca-blind-ps-dhm/home
https://github.com/OIRL/REU-PCA-BlindPS-DHM

Generalized computational framework for Structured Illumination Digital Holography Open-access tool for Phase Compensation Reconstruction Method in Digital Holographic Microscopy
https://sophiaresearchlaboratory.github.io/Blind-SI-DHM.io/

GPU-powered high-speed user interface for holographic microscopic imaging
https://github.com/jdmoralesb-eafit/HoloStream.

CycleGAN for Confocal Microscopy Image Translation
https://github.com/catrujilla/cycleGAN-SR_confocal.

High-speed phase aberration correction in digital holographic microscopy with vortex-Legendre method
https://github.com/sophiaresearchlaboratory/VortexDHM.

- **YouTube OIRL Channel**
  Leading OIRL Channel to deliver talks and promote education in basic research using YouTube platform. The scope of these videos includes providing further information that usually is not included in the peer-reviewed journals. Also, we show hands-on demonstrations of building imaging systems and the use of optical tools to align them.
  Senior Project, Multi-plane holographic Display: https://youtu.be/KW2PCe1TfS8
  Alignment Protocol of a polarization-sensitive microscope
  English: https://youtu.be/hPlEgnR8rgo
  Spanish: https://youtu.be/wWaO-Sj5gLM
  Alignment Protocol of a spatial filter system
  https://youtu.be/WaAkwVRc7Is
  https://youtu.be/-fmMCMQfXLo

Research Talk

OpenSRQPI Tool

https://www.youtube.com/watch?v=maJru9mbTF8 (English)
https://www.youtube.com/watch?v=KBJkqVI6yAE (English)

HoloBio

https://youtu.be/GxsejY7T7Fo (English)
https://youtu.be/tdSTnbEJIGo (English)
https://youtu.be/zwP4dBpSZdc (English)
https://youtu.be/tyop_0fGQH0 (English)
https://youtu.be/n-xLbzZvRtU (English)
https://youtu.be/LPxw7PKBiLs (English)

tuDHM (English): https://youtu.be/UBba7U3wM_8
tuDHM (Spanish): https://youtu.be/lA5QttNlscQ
HM2F (Spanish): https://youtu.be/A_JIktIQ-uo
cGAN-DHM (English): https://youtu.be/gBsgQ46fsdo
cGAN-DHM (Spanish): https://youtu.be/T_wVN41-izQ
Semi-heuristic phase compensation algorithm (English): https://youtu.be/LPxw7PKBiLs
Semi-heuristic phase compensation algorithm (Spanish): https://youtu.be/NJVU6tUs1cI
3D QPI-DHM (English): https://youtu.be/sZx37Vj-vxE?si=X9bRzjTPdWrJZu_C
3D QPI-DHM (Spanish): https://youtu.be/g59JQNtA7fw?si=XD0V1Nyu2odKr9ZF
Open-Source Reconstruction Tool for Non-telecentric DHM Reconstruction (English): https://www.youtube.com/watch?v=Hyi5vwgYX7c
Open-Source Reconstruction Tool for Non-telecentric DHM Reconstruction (Spanish): https://youtu.be/pWOGKR2vhno

pyDHM library

How to Install the library (English): https://youtu.be/h76nZM6JpXo
How to use the blind 2-frame PS function (BPS2): https://youtu.be/Z9o0ODe1IUQ
How to use the angular spectrum function: https://youtu.be/3p6Bsh048Hw
How to use the FRS function: https://youtu.be/CMHbF0uoWDk

no-tele DHM tool (English): https://youtu.be/Hyi5vwgYX7c

Raul's PhD dissertation: Improvements in Digital Holographic Microscopy

https://youtu.be/1ctP-ECatjI (PART I, English, recorded by Raul Castaneda)
https://youtu.be/_Adg6cgAyxs (PART II, English, recorded by Raul Castaneda)

- **Invited Talk in Maths Invitational for Girls (MIG) competition** June 2020
  Invited speaker at the 5th Math Invitational for Girls (MIG) competition for middle-school girls in 2020.
  Title: Why is important Maths in my professional career?
- **Invited Talk in Maths Honors Seminar, The University of Memphis** February 2021
  Invited speaker at the Honors Seminar of the Department of Mathematical Sciences at the University of Memphis.
  Title: Math in Imaging Systems.

ADVISING/MENTORING

UMASS DARTMOUTH

Undergraduate Level

- Mia Linhares – EE — Spring 2026
- Alan Schneider – EE — Summer 2025
- Justin Goncalves – EE — Summer 2025 - present
- Rafael Pinheiro – EE — Spring 2026
- Christopher Pereira, EE — Fall 2025 – Spring 2026
- Craig Belanger, EE — Fall 2025 – Spring 2026

Graduate Level

- Sofia Obando-Vasquez – Ph.D. Candidate — Fall 2024 – present
- Piper Dienst – MS Candidate, — Spring 2025 - present
- Matthew Aguiar – MS Degree — Spring 2025 – Fall 2025
- Jack Roche – MS Degree — Fall 2025
- Joseph Clivens – MS Degree — Fall 2024 – Spring 2025
- Sagnik Kundu – MS Candidate — Spring 2024 – Summer 2024
- Brian Bogue-Jimenez – Ph.D. Candidate — Fall 2023

UNIVERSITY OF MEMPHIS

Graduate Level

- Raul Castaneda – Ph.D. candidate — Fall 2019 – Fall 2022
  - Five first-author peer-reviewed manuscript.
  - Presented three oral presentations.
- Charity Hayes-Rounds – MS candidate — Fall 2019 – Spring 2022
  - First Generation STEM Doctoral Fellowship (*move to Ph.D. to MS in Spring 2022*)
  - Published 1 co-shared first-author manuscript within a year of joining our program.
  - Presented two oral presentations.
- Brian Bogue-Jimenez – Ph.D. Candidate — Fall 2020 – Spring 2023
  - Presented two oral presentations in Spring 2022 and Fall 2022.
  - Published 1 co-shared first-author manuscript as undergraduate student.
  - Published his first-author peer-reviewed manuscript in Spring 2022 based on his MS results.
  - Graduate Research Assistant on the NSF CAREER award
- Bin Feng – MS Degree — Fall 2020 – Fall 2021
  - Co-author of an oral presentation in Spring 2022.
- Shashwat Patra – MS Degree — Fall 2021 – Spring 2023
  - Presented an oral presentation at the Southeast Symposium on Contemporary Engineering Topics in October 14, 2022
  - Accepted oral presentation at SPIE Photonics West ‘23

Undergraduate Level

- Brian Bogue Jimenez — Spring 2019 – Spring 2020
  - Mentored Junior Project
  - Research Assistantship
  - Mentored Senior Project
- Bin Feng, Ian Doarn, Mohammed Younis, Jody Montgomery — Fall 2019 – Spring 2020
  - Mentored Senior Project
- Chris Butler, Jarret Joyner, Sam Horne — Spring 2020 – Fall 2020
  Naif Alhwsawi, Othman Alkandri, Mamadou Ba
  - Mentored Senior Project
- Philip Manzo, Zachary Pendley, Timothy Banks — Spring 2021 – Fall 2021
  - Mentored Senior Project

- Sofia Obando-Vasquez Fall 2020 – Fall 2021
    - Experimental and Computational Studies of polarization-sensitive bright-field microscopy and digital holographic microscopy.
    - Computational Modeling of blind phase-shifting algorithms for three-wave-interfering structured illumination microscopy.
    - Mentored of her senior project defended in November 2021.
- Luke Hamilton, Jihan Abbas Spring 2021
  Noah Wargo Fall 2021
    - Helen Hardin Honors College, Course EECE 2207
- Andrej Antic, Ryan E. Williamson
    - Helen Hardin Honors College, Course EECE 3240 Spring 2022
- Ethan Costello Spring 2021 –
    - Helen Hardin Honors College, Course EECE 2207 Spring 2021
    - Helen Hardin Honors College, Course EECE 3240 Spring 2022
    - Mentored of Research Experiences Fall 2021 – Spring 2022
    - First-author manuscript published in the QuaesitUM — the UofM's Undergraduate Research Spring 2022
    - Helen Hardin Honors College, Course EECE 4901 Fall 2022
- Joshua Brown Spring 2021 – present
    - Helen Hardin Honors College, Course EECE 2207 Spring 2021
    - Advisee of Honors Summer Research Fellowship Summer 2022
    - First-author manuscript under preparation (to be submitted in the QuaesitUM — the UofM's Undergraduate Research Journal by January 2023).
- Allan Abraham, Kameshwaran Balachandra Fall 2022 – Spring 2023
    - Mentored of Research Experiences

Graduate Committee Service

- Tomas Lloret Lopez, Ph.D. Candidate, Universidad de Alicante (Spain), Polytechnic School Alicante
    - PhD thesis: "Holographic lens characterization for imaging and nonimaging photonic systems"
    - Defense Date: December 2024
    - Advisors: Dr. Inmaculada Pascual Villalobos and Dr. Marta Morales Vidal
    - Role: External MSc. Dissertation Reviewer
- Diego A. Pulgarin, MS. Candidate, EAFIT University (Medellin, Colombia), School of Applied Sciences and Engineering
    - Master thesis: "Deep learning-based method for mitigating mirror and aliasing caused by lateral subsampling in the Fourier domain in optical coherence tomography"
    - Advisors: Dr. Rene Restrepo Gomez, Dr. Carlos Trujillo Anaya, and Dr. Juan Jose Cadavid
    - Defense Date: June 2025
    - Role: External MS. Dissertation Reviewer
- Maria Paula Rey Barrera, Capstone Senior Research, EAFIT University (Medellin, Colombia), School of Applied Sciences and Engineering
    - Capstone Senior Research Project: "Learning-based models to obtain amplitude and phase reconstructions of defocused holograms"
    - Advisors: Dr. Raul A. Castaneda Quintero and Dr. Juan David Martinez Vargas
    - Defense Date: November 2024

- Raul Castaneda, Ph.D. Candidate, Electrical and Computer Engineering, Univ. of Memphis
    - Title: Improvements in Digital Holographic Microscopy (Ph.D dissertation/thesis)
    - Defense Date: November, 2022
    - Role: Committee chair
- Maria Josef Lopera Acosta, MS Candidate, Applied Physics, EAFIT University (Colombia)
    - Defense Date: November 2022
    - Role: External Committee Member
- Charity Hayes-Rounds, MS Candidate, Electrical and Computer Engineering, Univ. of Memphis
    - Title: Implementation and analysis of Fresnel biprism-based Digital Holographic Microscopes (MS thesis)
    - Defense Date: March, 2022
    - Role: Committee chair
- Brian Bogue Jimenez, MS Candidate, Electrical and Computer Engineering, Univ. of Memphis
    - Title: Exploring non-invasive features for continuous glucose monitoring (MS thesis)
    - Defense Date: October 2021
    - Role: Committee chair
- Bin Feng, MS Candidate, Electrical and Computer Engineering, Univ. of Memphis
    - Title: Marker-less motion capture system using OpenPose (MS thesis)
    - Defense Date: October 2021
    - Role: Committee chair
- Thomas Watson, MS Candidate, Electrical and Computer Engineering, Univ. of Memphis
    - Defense Date: October 2021
    - Role: Committee Member
- Rudolph Brown, MS Candidate, Electrical and Computer Engineering, Univ. of Memphis
    - Defense Date: December 2019
    - Role: Committee Member
- Sebastian Bedoya, MS Candidate, Electrical and Computer Engineering, Univ. of Memphis
    - Defense Date: April 2019.
    - Role: Committee Member
- Hasti Shabani, Ph.D. Candidate, Electrical and Computer Engineering, Univ. of Memphis
    - Defense Date: February 2019
    - Role: Committee Member
- Ananya Dutta, MS Candidate, Electrical and Computer Engineering, Univ. of Memphis
    - Defense Date: November 2017
    - Role: Committee Member
- Nurmohammed Patwary, Ph.D. Candidate, Electrical and Computer Engineering, Univ. of Memphis
    - Defense Date: November 2017
    - Role: Committee Member
- Anabel Llavador, Ph.D. Candidate, Physics, Univ. of Valencia (Spain)
    - Defense Date: July 2017
    - Role: Substitute Secretary
- Christopher Taylor, MS Candidate, Electrical and Computer Engineering, Univ. of Memphis
    - Defense Date: March 2016
    - Role: Committee Member

ADMINISTRATION COMMITTEE SERVICE

UMASS DARTMOUTH

- Graduate Committee, ECE Department — Fall 2023 – present
- ECE Recruitment Committee — Spring 2025
- ECE ABET Assessment Committee — Fall 2025 - Spring 2028

THE UNIVERSITY OF MEMPHIS

- Undergraduate Committee, EECE Department — Spring 2022 – Spring 2023
- Graduate Committee, EECE Department — Spring 2020-Spring 2022
- Senior Design Committee, EECE Department — Fall 2021 – Spring 2023
- Member of the UMRC Research Strategic Plan — Summer 2022
- Research Assistant Professor Hiring Committee, Electrical and Computer Engineering, January 2022
- Administrative Associate Hiring Committee, Electrical and Computer Engineering, October 2020
- Postdoctoral Hiring Committee, Electrical and Computer Engineering, March 2019