

Henry Quach

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Optical Design & Analysis Portfolio: www.henryquach.org

EDUCATION

UNIVERSITY OF ARIZONA

PH.D., OPTICS/OPTICAL SCIENCES
2018 –2022

DUKE UNIVERSITY

BS, MECHANICAL ENGINEERING
2013 –2017

SKILLS

OPTICAL DESIGN + ANALYSIS

Zemax OpticStudio • LightTools • FRED
Polaris-M (Polarization Raytracing)

OPTOMECHANICAL

Optical Alignment • Tolerance Budgeting
Sensitivity Analysis

SolidWorks • NX • 3D Printing
CNC • Fixture and Tooling Design

PROGRAMMING

Matlab • Mathematica • SQL • Python

Image Processing: Filtering, Convolution,
Fourier Analysis, Zernike Decomposition

PUBLICATIONS

OPTICS LETTERS

Non-Planar Illumination Deflectometry
for Axicon Measurement
Published June 2022.
H. Quach et. al

PHOTONICS

Surface Measurement of a Large
Inflatable Reflector in Cryogenic Vacuum
Published Jan 2022.
H. Quach et. al

OPTICS EXPRESS

Infinite Deflectometry Enabling
 2π -Steradian Measurement Range
Published Jan 2019
L. R. Graves, H. Quach et. al

EMPLOYMENT AND EXPERIENCE

ASML, EUV PLASMA METROLOGY

SENIOR OPTICAL SENSING ENGINEER | FEB 2023 – PRESENT | SAN DIEGO, CA

- *Optical Engineering:* imaging/illumination/stray light analysis in Zemax, lens design and aberration theory, geometrical optics and Gaussian beam modeling, Monte Carlo simulation, radiometry/photon budgets.
- *Optomechanical Engineering:* thermal, adhesive, mounting, tolerance stackups, optical alignment, sensitivity analysis; ISO 10110.
- Lead optical signal chain design among optics, electronics, controls, and firmware ICs/Architects/POs/PLs. Plan, execute, and deliver critical bench test and source test validation campaigns.
- Lead PDRs, CDRs, FMEAs, safety risk assessments with effective collaboration from cross-functional groups in US/NL.
- *Building Block Owner:* responsible for technical development, module integration and testing, industrialization, and handling field escalations for optical diagnostic laser + camera hardware.

NIKON RESEARCH

OPTICAL SCIENTIST INTERN | SUMMER 2022 | ORO VALLEY, AZ

- Comprehensively applied lens design, radiometry, and image processing towards new architectures in laser processing and optical metrology.
- Redesigned, built, and analyzed the performance of a multi-path, multi- λ (VIS, NIR, SWIR) imaging and illumination system in Zemax OpticStudio.
- Calibrated and characterized high-speed (2k+ fps) imaging systems using oscilloscopes, resolution targets, integrating spheres, power meters, and a monochromator.

LAWRENCE LIVERMORE NATIONAL LABORATORY

OPTICAL ENGINEERING INTERN | SUMMER 2021 | LIVERMORE, CA

- Analyzed multiple-wavelength stray light and ghosts from a gigawatt laser system using FRED non-sequential raytracing software.
- Optically modeled multiple-reflection, tip/tilt, defocus image sensitivity between beamsplitters, windows, lenses, mirrors, and prisms.
- Wrote Matlab & SQL pipelines to unify laser shot data (calorimeters, pyrometers, and CMOS detectors) for temporal and spatial analyses.

INTUITIVE SURGICAL

MECHANICAL ENGINEER | 2017 – 2018 | SUNNYVALE, CA

- Mechanical design and process engineering for complex robotic surgical instruments across da Vinci Xi and da Vinci SP product families.
- Designed and implemented tooling for laser welding, pneumatic crimping, seal lubrication, and Instron testing, from machined parts designs and drawings through process qualification (IQ/OQ/PQ).
- Coordinated with supplier, quality, and regulatory engineers to investigate, root-cause, and resolve defects in product.