COLLEGE OF ENGINEERING AND COMPUTER SCIENCE
FLORIDA ATLANTIC UNIVERSITY

Announces the Ph.D. Dissertation Defense of

Mahshad Javidan

for the degree of Doctor of Philosophy (Ph.D.)

"Optimization of Data Acquisition in Optical Tomography Based on Estimation Theory"

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DEPARTMENT:
Department of Electrical Engineering and Computer Science.

ADVISOR:
Ramin Pashie, Ph.D.

PH.D. SUPERVISORY COMMITTEE:
Ramin Pashaie, Ph.D., Chair
Jason O. Hallstrom, Ph.D.
Taghi M. Khoshgoftaar, Ph.D.
Behnaz Ghoraani, Ph.D.

ABSTRACT OF DISSERTATION
Optimization of Data Acquisition in Optical Tomography Based on Estimation Theory

In tomography, three-dimensional images of a medium are reconstructed from a set of two-dimensional projections. Each projection is the result of a measurement made by the scanner via radiating some form of energy and collecting the scattered field after interacting with the medium. Information content of these measurements are not equal and one projection can be more informative than others. By choosing the most informative measurement at every step of scanning, an optimal tomography system can maximize the speed of data acquisition, temporal resolution of acquired images, reduce the operation cost and exposure to possible harmful radiations. The aim of this research was to introduce mathematical algorithms that can be used to design measurements with optimal information content when imaging static or dynamically evolving objects.

BIOGRAPHICAL SKETCH
Born in Isfahan, Iran.
B.S., University of Isfahan, Isfahan, Iran, 2015
M.S., University of Isfahan, Isfahan, Iran, 2018
Ph.D., Florida Atlantic University, Boca Raton, Florida, 2023

CONCERNING PERIOD OF PREPARATION
& QUALIFYING EXAMINATION

Time in Preparation: 2021 - 2023

Qualifying Examination Passed: Spring 2020

Published Papers:

Javidan, M., Esfandi, H. and Pashaie, R., 2021. Optimization of data acquisition operation in optical tomography based on estimation theory. *Biomedical optics express*, 12(9), pp.5670-5690.

Javidan, M., Esfandi, H. and Pashaie, R., 2021, November. Optimal Scanning Protocol for Optical Tomography. In *2021 43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)* (pp. 3986-3989). IEEE.

Javidan, M., Esfandi, H. and Pashaie, R., 2023, March. Optimal tomography of dynamically evolving objects using machine learning algorithms. In *Optical Tomography and Spectroscopy of Tissue XV* (Vol. 12376, pp. 88-92). SPIE.

Javidan, M., Esfandi, H. and Pashaie, R., 2021. Optimal Data Acquisition in Tomography. *Journal of Optical Society of America*, (under revision).