Kenneth Parker Trofatter
Ph.D. Electrical Engineering

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EDUCATION
Duke University, Pratt School of Engineering ECE, Durham, NC
Ph.D. Electrical Engineering   2022
Major Area: Imaging & Information Physics
Thesis: "Microwave Imaging For Walk-While-Scan Security Screening"
Advisor: Prof. David R. Smith

University of Tennessee, Knoxville, TN
B.S. Engineering Physics   2011
B.S. Computer Science   2011

RESEARCH EXPERIENCE
Duke University, Pratt School of Engineering ECE, Durham, NC
Associate in Research, Graduate Fellow   2013-2018
Contributed to DHS MetaImager project, an inter-institutional collaboration that engineered a millimeter wave imaging system that can scan people in motion. System integrator. Developed UI, GUI, and data visualization. Research lead on depth camera sensor fusion and image stitching. Researched system registration, system calibration, and image reconstruction acceleration. Prepared technical reports for consumption by people of various levels of technical expertise. Gave presentations to program managers at major reviews.
PIs: Prof. David R. Smith, Prof. Matt S. Reynolds

PROFESSIONAL EXPERIENCE
Neurophos Inc., Durham, NC
Consultant   2022
Contributed to experimental research for optical computing startup. Implemented a cross-platform multithreaded Thorlabs APT controller USB host in C with a high-level Python interface. Interfaced with a closed-loop piezo-actuated linear stage in an interferometer. and began researching wavefront calibration. Implemented hardware and software for remote experiment operation. Participated in technical discussions.

TEACHING EXPERIENCE
Duke University, Pratt School of Engineering ECE, Durham, NC
Teaching Assistant, ECE 590 Math and Physics in Imaging   2018
Proofread and edited lessons, created answer keys, graded homework, and held office hours.

Head Teaching Assistant, ECE 250 Computer Architecture   2018
Managed undergraduate TAs, proctored and graded exams, and held office hours.

Undergraduate Lab Mentor, Smith Group   2014-2019

AWARDS AND HONORS
UTK Douglas V. Roseberry Award for outstanding physics/astronomy upperclassman   2009

PUBLICATIONS AND PRESENTATIONS

Trofatter, K., (2022) "Microwave Imaging For Walk-While-Scan Security Screening" Ph.D. Thesis

Trofatter, K., Gollub, J., Smith, D. (upcoming) "Stitching 3D Millimeter Wave Images of a Person in Motion"

Trofatter, K., Gollub, J., Smith, D. (2018) "A geometric model for stitching millimeter-wave images of people in motion (Conference Presentation)." In *Passive and Active Millimeter-Wave Imaging XXI*, vol. 10634, p. 106340H. SPIE

OTHER PUBLICATIONS

Sleasman, T., Imani, M., Diebold, A., Boyarsky, M., Trofatter, K., Smith, D. (2022) "Computational Imaging With Dynamic Metasurfaces: A Recipe for Simple and Low-Cost Microwave Imaging." *IEEE Antennas and Propagation Magazine* 64, no. 4: 123-134

Sleasman, T., Imani, M., Diebold, A., Boyarsky, M., Trofatter, K., Smith, D. (2020) "Implementation and characterization of a two-dimensional printed circuit dynamic metasurface aperture for computational microwave imaging." *IEEE Transactions on Antennas and Propagation* 69, no. 4: 2151-2164

Sleasman, T., Imani, M., Boyarsky, M., Trofatter, K., Smith, D. (2019) "Computational through-wall imaging using a dynamic metasurface antenna." *OSA Continuum* 2, no. 12: 3499-3513

Mizrahi, O., Imani, M., Trofatter, K., Gollub, J., Smith, D. (2019) "2D ray tracing analysis of a dynamic metasurface antenna as a smart motion detector." *IEEE Access* 7: 159674-159687

Pedross-Engel, A., Arnitz, D., Gollub, J., Yurduseven, O., Trofatter, K., Imani, M., Sleasman, T., et al. (2018) "Orthogonal coded active illumination for millimeter wave, massive-MIMO computational imaging with metasurface antennas." *IEEE Transactions on Computational Imaging* 4, no. 2: 184-193

Gollub, J., Yurduseven, O., Imani, M., Odabasi, H., Sleasman, T., Trofatter, K., Boyarsky, M., Marks, D., Smith, D. (2017) "Computational imaging using frequency-diverse metasurfaces." In *2017 11th European Conference on Antennas and Propagation (EUCAP)*, pp. 1208-1211. IEEE

Sleasman, T., Imani, M., Yurduseven, O., Trofatter, K., Gowda, V., Marks, D., Gollub, J., Smith, D. (2017) "Near field scan alignment procedure for electrically large apertures." *IEEE Transactions on Antennas and Propagation* 65, no. 6: 3257-3262

Smith, D., Reynolds, M., Gollub, J., Marks, D., Imani, M., Yurduseven, O., Arnitz, D., Pedross-Engel, A., Sleasman, T., Trofatter, K., et al. (2017) "Security screening via computational imaging using frequency-diverse metasurface apertures." In *Passive and Active Millimeter-Wave Imaging XX*, vol. 10189, pp. 76-82. SPIE

Gollub, J., Yurduseven, O., Trofatter, K., Arnitz, D., Imani, M., Sleasman, T., Boyarsky, M., et al. (2017) "Large metasurface aperture for millimeter wave computational imaging at the human-scale." *Scientific reports* 7, no. 1: 42650

Yurduseven, O., Gollub, J., Trofatter, K., Marks, D., Rose, A., Smith, D. (2016) "Software calibration of a frequency-diverse, multistatic, computational imaging system." *IEEE Access* 4: 2488-2497

Lipworth, G., Rose, A., Yurduseven, O., Gowda, V., Imani, M., Odabasi, H., Trofatter, K., Gollub, J., Smith, D. (2015) "Comprehensive simulation platform for a metamaterial imaging system." *Applied optics* 54, no. 31: 9343-9353