

Qiyuan (Isabelle) Hu

5035 S East End Ave, Chicago, IL 60615 | qhu@uchicago.edu | 612-360-6337

SUMMARY

- Medical physicist and imaging scientist with a focus on developing artificial intelligence methods for quantitative medical image analysis to improve healthcare
- Interdisciplinary collaborator working at the intersection of physics, medicine, computer science, and statistics
- Author of 3 publications in peer-reviewed journals including 2 first-author papers, and 4 conference proceeding papers

EDUCATION

University of Chicago

PhD in Medical Physics

Chicago, IL
Expected 2021

- American Association of Physicists in Medicine Graduate Fellowship: Awarded to one outstanding incoming doctoral student each year to support the first two years of graduate study
- American Association of Physicists in Medicine Expanding Horizons Travel Grant

Carleton College

B.A., Physics, Mathematics. Graduated summa cum laude with distinction in Physics

Northfield, MN
Sep. 2013 – Jun. 2017

- Patricia V. Damon Merit Scholarship: Awarded for a strong academic profile and extra-curricular accomplishment
- Dean's List in all academic years, Exemplary Writing Portfolio, Phi Beta Kappa First Year Prize

RESEARCH EXPERIENCE

University of Chicago, Committee on Medical Physics

Doctoral Researcher, Advisor: Maryellen Giger, PhD

Chicago, IL
Sep. 2017 – present

Topics: Artificial Intelligence for Medical Image Analysis for Breast Cancer Multiparametric MRI and COVID-19 Chest Radiography

- Develop novel computer vision methods using deep learning and human-engineered radiomic features for breast cancer diagnosis based on high-dimensional multiparametric MRI
- Collaborate with radiologist to visualize and interpret decisions of deep neural networks
- Investigate machine learning methods for COVID-19 diagnosis, prognosis, and treatment response
- Establish large-scale, open-source COVID-19 chest radiography and computed tomography database to contribute to the NIH-funded Medical Imaging and Data Resource Center

Mayo Clinic Graduate School, Department of Biomedical Engineering

Summer Research Intern, Advisors: Lifeng Yu, PhD, Cynthia McCollough, PhD

Rochester, MN
Jun. – Aug. 2016

Funded by Mayo Graduate School Summer Undergraduate Research Fellowship

Topics: Determining Human Observer Performance in Lung Cancer Screening CT

- Designed and performed a virtual clinical trial for lung cancer screening CT using 12 conditions of nodule size, nodule type, acquisition dose level, and image reconstruction method
- Analyzed human observer performance which contributed to the development and validation of model observers and protocol optimization

MIT, Department of Electrical Engineering and Computer Science

Summer Research Intern, Advisor: Mildred Dresselhaus, PhD

Cambridge, MA
Jun. – Aug. 2015

Funded by Kolenkow Reitz Fund for Undergraduate Research

Topics: Raman Spectroscopy of Low-Dimensional Electrical Biased Device

- Designed and built an experimental set up and measured the Raman spectroscopy of graphene p-n junctions, which has potential applications in electronic devices
- Prepared ultrathin samples of GaTe, a novel 2-D material for electronic devices, to study its electrical properties

Carleton College, Department of Physics and Astronomy

Independent Research Student and Summer Research Student, Advisor: Nelson Christensen, PhD

Northfield, MN
2014 – 2015

Topic: Schumann Resonance Measurement for noise analysis in LIGO's gravitational wave detection

- Designed and tested a circuit to collect Schumann resonance signals obtained from noncommercial antennas
- Measured Schumann resonance signals in outdoor low-noise environment to potentially subtract from signals detected by the LIGO gravitational-wave interferometers

SKILLS

Programming: Python, R, MATLAB, Java, Mathematica

Languages: English, Mandarin Chinese

PUBLICATIONS AND PRESENTATIONS

Journal Publications:

1. Hu Q, Whitney HM, Giger ML. "A deep learning methodology for improved breast cancer diagnosis using multiparametric MRI." *Scientific Reports* 10.1 (2020): 1-11.
2. Hu Q, Whitney HM, Giger ML. "Radiomics methodology for breast cancer diagnosis using multiparametric magnetic resonance imaging." *Journal of Medical Imaging* 7.4 (2020): 044502.
3. Gong H, Hu Q, Walther A, Koo CW, Takahashi EA, Levin DL, Johnson TF, Hora MJ, Leng S, Fletcher JG, McCollough CH. "Deep-learning-based model observer for a lung nodule detection task in computed tomography." *Journal of Medical Imaging* 7.4 (2020): 042807.

Select Proceeding Papers and Presentations (out of 7):

1. Hu Q, Whitney HM, Giger ML. "Using ResNet feature extraction in computer-aided diagnosis of breast cancer on 927 lesions imaged with multiparametric MRI." *Medical Imaging 2020: Computer-Aided Diagnosis*. Vol. 11314. International Society for Optics and Photonics (SPIE), 2020. (Proceeding paper. Oral presentation.)
2. Hu Q, Whitney HM, Giger ML. "Transfer Learning in 4D for Breast Cancer Diagnosis using Dynamic Contrast-Enhanced Magnetic Resonance Imaging." *arXiv preprint arXiv:1911.03022* (2019). The 33rd Neural Information Processing Systems Conference (NeurIPS) Machine Learning for Health Workshop (ML4H). Extended Abstract. Poster presentation.)
3. Hu Q, Whitney HM, Edwards A, Papaioannou J, Giger ML. "TU-HI-SAN2-9: Multiparametric breast MRI radiomics in distinguishing between benign and malignant breast lesions." *Medical Physics* Vol. 46. No. 6., 2019. American Association of Physicists in Medicine (AAPM). (Selected oral presentation in the Science Council session. Highlighted as best of AAPM at American Society for Radiation Oncology [ASTRO] 2019 annual meeting.)
4. Hu Q, Whitney HM, Edwards A, Papaioannou J, Giger ML. "Radiomics and deep learning of diffusion-weighted MRI in the diagnosis of breast cancer." *Medical Imaging 2019: Computer-Aided Diagnosis*. Vol. 10950. International Society for Optics and Photonics (SPIE), 2019. (Proceeding paper. Poster presentation.)
5. Gong H, Walther A, Hu Q, Koo CW, et al. "Correlation between a deep-learning-based model observer and human observer for a realistic lung nodule localization task in chest CT." *Medical Imaging 2019: Image Perception, Observer Performance, and Technology Assessment*. Vol. 10952. International Society for Optics and Photonics (SPIE), 2019. (Proceeding paper. Oral presentation given by Gong H.)

LEADERSHIP AND SERVICE

Society of Photo-Optical Instrumentation Engineers (SPIE) Student Chapter, University of Chicago

Vice President, 2019-2020; Treasurer and founding member, 2018

- Organized optics-related activities, such as outreach events, Fermi lab tour, guest speaker seminars, etc.

Mentoring and Teaching:

- Supervised 2 undergraduate summer research students
- Teaching assistant for 2 graduate courses: Physics of Radiation Therapy, Physics of Medical Imaging I Practicum
- Mentored first-year international graduate students in the Global Mentorship Network at University of Chicago

Outreach:

- Coached high school students in the Girls Who Code after-school program at Kenwood Academy
- Mentored high school students in the Women in STEM program at the University of Chicago Laboratory Schools

Review: Reviewer for journals including European Radiology, Journal of Medical Imaging, Journal of Magnetic Resonance Imaging, and IEEE Transactions on Biomedical Engineering.