

Stanford



Ahmed Nagy El Kaffas

Instructor, Radiology

Bio

BIO

We develop quantitative imaging methods to characterize the tumor microenvironment, and to subsequently relate these imaging parameters to biomarkers that can be used for cancer surveillance, diagnosis and treatment monitoring/characterization. The focus is on 1) developing new acquisition methods and protocols to enhance quantification, 2) designing new image processing algorithms, analysis parameters and statistical models to quantitatively characterize imaging data, and 3) using advanced AI methods to further refine quantification or classification. While our methods can be used for other imaging modalities, we primarily focus on Ultrasound imaging modes such as contrast, molecular, elastography and spectroscopic ultrasound. Disease focus include liver cancer and liver metastasis, liver fibrosis/cirrhosis, and tumor blood flow characterization.

ACADEMIC APPOINTMENTS

- Instructor, Radiology

PROFESSIONAL EDUCATION

- PhD, University of Toronto/Sunnybrook Research Institute , Medical Biophysics - Imaging Physics and Radiation Oncology (2014)
- MSc, Ryerson University , Physics (2008)
- BEng, Ryerson University , Electrical and Computer Engineering (2005)

Teaching

COURSES

2019-20

- DataLucence::Images: BIOS 254 (Aut)

2018-19

- DataLucence::Images: BIOS 254 (Aut)

Publications

PUBLICATIONS

- **Quantitative ultrasound approaches for diagnosis and monitoring hepatic steatosis in nonalcoholic fatty liver disease** *THERANOSTICS*
Pirmoazen, A. M., Khurana, A., El Kaffas, A., Kamaya, A.
2020; 10 (9): 4277–89
- **Spatial Characterization of Tumor Perfusion Properties from 3D DCE-US Perfusion Maps are Early Predictors of Cancer Treatment Response.** *Scientific reports*

- El Kaffas, A., Hoogi, A., Zhou, J., Durot, I., Wang, H., Rosenberg, J., Tseng, A., Sagreiya, H., Akhbardeh, A., Rubin, D. L., Kamaya, A., Hristov, D., Willmann, et al
2020; 10 (1): 6996
- **Quantitative ultrasound approaches for diagnosis and monitoring hepatic steatosis in nonalcoholic fatty liver disease.** *Theranostics*
Pirmoazen, A. M., Khurana, A., El Kaffas, A., Kamaya, A.
2020; 10 (9): 4277–89
 - **A multi-model framework to estimate perfusion parameters using contrast-enhanced ultrasound imaging** *MEDICAL PHYSICS*
Akhbardeh, A., Sagreiya, H., El Kaffas, A., Willmann, J. K., Rubin, D. L.
2019; 46 (2): 590–600
 - **Quantitative Ultrasound Spectroscopy for Differentiation of Hepatocellular Carcinoma from At-risk and Normal Liver Parenchyma.** *Clinical cancer research : an official journal of the American Association for Cancer Research*
Durot, I., Sigrist, R., Kothary, N., Rosenberg, J., Willmann, J. K., El Kaffas, A.
2019
 - **A Multi-Model Framework to Estimate Perfusion Parameters Using Contrast-Enhanced Ultrasound Imaging.** *Medical physics*
Akhbardeh, A., Sagreiya, H., El Kaffas, A., Willmann, J. K., Rubin, D. L.
2018
 - **Pharmacokinetic Modeling of Targeted Ultrasound Contrast Agents for Quantitative Assessment of Anti-Angiogenic Therapy: a Longitudinal Case-Control Study in Colon Cancer.** *Molecular imaging and biology : MIB : the official publication of the Academy of Molecular Imaging*
Turco, S., El Kaffas, A., Zhou, J., Lutz, A. M., Wijkstra, H., Willmann, J. K., Mischi, M.
2018
 - **Role of Acid Sphingomyelinase and Ceramide in Mechano-Acoustic Enhancement of Tumor Radiation Responses** *JNCI-JOURNAL OF THE NATIONAL CANCER INSTITUTE*
El Kaffas, A., Al-Mahrouki, A., Hashim, A., Law, N., Giles, A., Czarnota, G. J.
2018; 110 (9): 1009–18
 - **Tumour Vascular Shutdown and Cell Death Following Ultrasound-Microbubble Enhanced Radiation Therapy** *THERANOSTICS*
El Kaffas, A., Gangeh, M. J., Farhat, G., Tran, W., Hashim, A., Giles, A., Czarnota, G. J.
2018; 8 (2): 314–27
 - **INTRA-INDIVIDUAL COMPARISON BETWEEN 2-D SHEAR WAVE ELASTOGRAPHY (GE SYSTEM) AND VIRTUAL TOUCH TISSUE QUANTIFICATION (SIEMENS SYSTEM) IN GRADING LIVER FIBROSIS** *ULTRASOUND IN MEDICINE AND BIOLOGY*
Sigrist, R. S., El Kaffas, A., Jeffrey, R., Rosenberg, J., Willmann, J. K.
2017; 43 (12): 2774–82
 - **Early prediction of tumor response to bevacizumab treatment in murine colon cancer models using three-dimensional dynamic contrast-enhanced ultrasound imaging** *ANGIOGENESIS*
Zhou, J., Zhang, H., Wang, H., Lutz, A. M., El Kaffas, A., Tian, L., Hristov, D., Willmann, J. K.
2017; 20 (4): 547–55
 - **Molecular Contrast-Enhanced Ultrasound Imaging of Radiation-Induced P-Selectin Expression in Healthy Mice Colon.** *International journal of radiation oncology, biology, physics*
El Kaffas, A., Smith, K., Pradhan, P., Machtaler, S., Wang, H., von Eyben, R., Willmann, J. K., Hristov, D.
2017; 97 (3): 581-585
 - **Ultrasound Elastography: Review of Techniques and Clinical Applications** *THERANOSTICS*
Sigrist, R. M., Liao, J., El Kaffas, A., Chammas, M. C., Willmann, J. K.
2017; 7 (5): 1303-1329
 - **Quantitative Three-Dimensional Dynamic Contrast-Enhanced Ultrasound Imaging: First-In-Human Pilot Study in Patients with Liver Metastases** *THERANOSTICS*
El Kaffas, A., Sigrist, R., Fisher, G., Bachawal, S., Liao, J., Wang, H., Karanany, A., Durot, I., Rosenberg, J., Hristov, D., Willmann, J. K.
2017; 7 (15): 3745–58