Job Requisition: Postdoctoral Fellow in CEST MRI Metabolic Imaging and Machine Learning

Position Summary:
We are seeking a motivated and highly skilled postdoctoral fellow to join our research team focusing on advanced magnetic resonance imaging (MRI) methods to study tumor energy metabolism and develop machine learning models for image enhancement. The successful candidate will play a pivotal role in addressing cutting-edge challenges in metabolic imaging, machine learning, and model validation.

Key Responsibilities:

1. **Dynamic CEST MRI Studies:**
   o Perform dynamic glucose enhancement (DGE) CEST MRI to map glucose uptake and metabolism in prostate tumor xenograft models.
   o Compare PSMA-positive and PSMA-negative prostate cancers using high-temporal-resolution data (2.5 s/frame).
   o Analyze and integrate low-spatial-resolution DGE (850 µm²) and high-resolution static glucoCEST (200 µm²) data for validation.
   o Collaborate with optical imaging and histology teams to validate imaging results.
2. **Development of Superresolution Models:**
   o Create processing pipelines for superresolution in metabolic imaging using machine learning approaches, including deep generative adversarial neural networks (GANs).
   o Simulate organ-scale vascular networks and metabolism using angiographic images, perfusion flow simulations, and metabolic conversion rates from cell experiments.
   o Generate data for model training and testing.
3. **Patient-Specific Model Validation:**
   o Develop patient-specific metabolic and perfusion models based on MRA and anatomic MRI data from clinical subjects.
   o Evaluate models using metrics such as mean time to peak and compare results with actual imaging measurements.
   o Simulate metabolic MR images to enhance acquired metabolic images through superresolution techniques.
   o Assess the quality of superresolution results using image similarity metrics and expert ratings.

Qualifications:

- Ph.D. in Biomedical Engineering, Physics, Computer Science, or a related field.
- Experience with advanced MRI techniques, particularly CEST imaging, is highly desirable.
- Strong background in machine learning, especially deep learning models for image processing.
- Proficiency in programming languages such as Python, MATLAB, or similar.

- Familiarity with metabolic imaging, perfusion modeling, or optical imaging validation methods is a plus.
- Excellent analytical and problem-solving skills.
- Ability to work collaboratively in a multidisciplinary research environment.

Benefits and Opportunities:
This position provides an exciting opportunity to contribute to high-impact research at the intersection of biomedical imaging and machine learning. The candidate will have access to state-of-the-art imaging facilities, mentorship from leading researchers, and opportunities to publish in top-tier journals.

How to Apply:
Interested candidates should submit their CV, a cover letter describing their research interests and qualifications, and contact information for three references, to tsangwei.tu@howard.edu.

Location: Howard University
Position Type: Full-Time, Fixed-Term

We are an equal opportunity employer and welcome applicants from diverse backgrounds.