

# Joint Biomedical Engineering Seminar Series

MU ▪ MCW ▪ UWM

## SEMINAR

**Friday, October 27th, 2017**

12:00 – 1:00 pm

HRC Auditorium



## **Tugan Muftuler, PhD**

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Medical College of Wisconsin

### ***“Advanced Diffusion MRI Techniques to Study Brain Microstructure”***

Abstract: Brain white matter is affected by various diseases, insults and injuries. Diffusion MRI (DMRI) is a versatile technique to study brain white matter noninvasively. DMRI quantifies water diffusion patterns in relation to brain structures, and various parametric maps derived from DMRI help detect microstructural changes in tissues. The majority of the DMRI studies have used technique called diffusion tensor imaging (DTI) to measure white matter changes in various diseases. However, the DTI parameters are calculated based on the assumption that diffusion of water molecules follows a Gaussian distribution. In fact, the brain is a complex intracellular and extracellular environment that causes the diffusion to deviate from this pattern. Several advanced diffusion MRI techniques have been proposed to address this shortcoming. Here, I am going to first introduce the basic physics behind DMRI and then introduce some of the advanced DMRI methods.

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Medical College of Wisconsin is located at 1101 N. 87<sup>th</sup> St., Milwaukee, WI 53226. Parking is available across the street in visitor parking. Refreshments will be served.