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SEMINAR

*Rothia is red, Veillonella is blue: how to separate many colors,  
in one field of view*

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**Abstract:** Spectral microscopy is an imaging modality that combines spectroscopy and microscopy. In other words, a spectral microscope measures the spectrum of light at each pixel location across a biological sample. In samples where multiple fluorescent molecules exist in the same location, the observed spectra represent mixtures of different spectral profiles. Spectral unmixing is the process of decomposing these observed mixtures into their individual sources (i.e. determining the concentration of each fluorophore at each location). Spectral unmixing is an ill-posed inverse problem, and it requires prior knowledge to reach a physically meaningful solution. In this talk, we will discuss existing algorithms for spectral unmixing and how they can fail in real-world applications. We will then define a new unmixing algorithm that is rooted in microscopy and leverages key knowledge about image formation. Throughout the talk, we will discuss how these methods are used to study the spatial distribution of bacteria within different microbial biofilms.

Friday, February 15, 2019, 10:30 am  
Mathematics and Science Center: W201

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