



Solid State Institute
המכון למצב מוצק

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סמינר

Sparsity-based Recovery of Lost Optical Information

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Abstract

Many problems that arise in optics are inverse problems – i.e. the recovery of an unknown optical signal from measurements. However, many of the inverse problems in optics are ill posed – meaning that the same measurements result from an infinite number of signals. This is the case, for example, in diffraction-limited imaging that does not carry information on sub-wavelength features. Inverting such ill-posed problem means finding the 'true' object out of the infinitely many possible objects that would yield the measurements. The only way to select the true object out of all of the possible solutions is by using some prior information on the object.

This seminar will present several topics that deal with algorithmic recovery ill-posed problems using prior information. The prior information I used in my research is that every object has structure (i.e., is not random), and hence can be represented compactly (sparsely) under a known basis. For example, I will show an algorithmic paradigm for deciphering the 3D structure of a molecule from a single-shot 2D far-field intensity pattern, and an algorithmic technique for enhancing the resolution in optical fluorescence microscopy using dictionary learning.

ההרצאה תתקיים ביום רביעי, ה-22.11.17 בשעה 12:30

באודיטוריום המכון למצב מוצק, קומת כניסה

The lecture will take place on Wednesday, 22.11.17 at 12:30

at the Solid State Institute auditorium, entrance floor

Ph.D. Student of Distinguished Professor Moti Segev