הטכניון – מכון טכנולוגי לישראל **הפקולטה להנדסת מכונות**

סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ב' 30.11.15 (יח' בכסלו, תשע"ו), בבניין דן-קאהן, קומה 0, באודיטוריום 1 בשעה 14:30.

יוצא: עפר דגן

מנחה: פרופ"מ מורן ברקוביץ'

על הנושא:

SIMULATION TOOL COUPLING NON-LINEAR ELECTROPHORESIS AND REACTION KINETICS FOR DEVELOPMENT AND OPTIMIZATION OF NEW BIOSENSING ASSAYS

The seminar will be given in English

להלן תקציר ההרצאה:

Electrophoretic separation and concentration techniques are extensively used in a wide range of chemical and biochemical applications, including drug discovery, genetics, and food analysis. Recently, there is a growing interest in the use of on-chip electrophoretic techniques for rapid biosensing and point-of-care diagnostics, requiring not only separation and focusing of analytes, but also reaction, binding, and hybridization of participating species. Fast computational tools are an essential part of any such assay development, as they enable insight into physical and chemical processes and significantly reduce experimental time.

I will present the development, formulation, validation, and demonstration of a fast, generic and open-source simulation tool, which integrates non-linear electromigration with multispecies non-equilibrium reaction kinetics. The code is particularly useful for the design and optimization of new electrophoresis-based bioanalytical assays, in which electrophoretic transport (including separation and focusing), control analyte spatial concentration and subsequent reactions. The code can efficiently handle complex electrophoretic setups coupling sharp electric field gradients with bulk reactions, surface reactions, and competing reactions. In particular, I will demonstrate the use of the code for investigating accelerated reactions using isotachophoresis (ITP), revealing new regimes of operation which in turn enable significant improvement of signal to noise ratio of ITP-based genotyping assays.

בברכה,

שרון'/א אמיר שת

מרכז הסמינרים