

Michael Shoham Patrascu

+972 (055) 9188-027 , michael@technion.ac.il

RESEARCH INTERESTS

Process design, integration and intensification, reactive separations and reactors engineering, mathematical modeling, simulations, optimization, dynamical systems and control.

EDUCATION

Ph.D Chemical Engineering, Technion - I.I.T, Israel. 2015
Dissertation: "Scaled-down Hydrogen Production in Pd Membrane Reactors: Process Design and Experimental Investigations".
Advisor: Prof. Moshe Sheintuch.

Awarded the best PhD thesis in Process Intensification for the years 2015-2016 by the European Federation of Chemical Engineering.

B.Sc Chemical Engineering, Technion - I.I.T, Israel. 2008
Summa cum Laude

ACADEMIC RESEARCH EXPERIENCE

MIT, Process Systems Engineering Lab. 2015-2017
Postdoctoral Associate

- Lead research on rigorous dynamic optimization of a revolutionary *continuously operated* pharmaceuticals manufacturing plant, implementing a novel modeling and computational framework of *nonsmooth DAEs* and economic optimization strategy.
- Analyzed nonsmooth dynamical systems in chemical engineering and processing.

PI: Prof. Paul I. Barton

Technion - I.I.T, Israel, Chemical Engineering Dept. 2010-2015
Ph.D Candidate

- Designed, modeled and simulated complex intensified processes for pure H₂ production by steam reforming of methane and biofuels in Pd-membrane reactors.
- Integrated several processes; endothermic and exothermic reactions, membrane separation and heat-exchange, in one compact and efficient unit. These systems allow *on-site* and *on-board* pure H₂ production to feed Fuel Cells, eliminating the need for special technology for H₂ transport and storage.
- Constructed these systems and conducted experiments to validate the simulation results. Careful analysis showed that H₂ transmembrane permeance is the main design parameter, and it depends on local conditions, specifically the local gas composition.
- Collaborated in large European consortia under the FP7: CoMeTHy and CARENA.
- Successfully mentored and guided foreign Italian Ph.D and Master students, leading to a publication.

PI: Prof. Moshe Sheintuch

Technion - I.I.T, Israel, Chemical Engineering Dept. 2008
Undergraduate Research Assistant

- Conducted research on detecting chronic renal failure by an *electronic-nose* based on carbon black polymer sensors to differentiate between sick and healthy populations in rat model, using principle component analysis (PCA).

PI: Prof. Hossam Haick

INDUSTRIAL EXPERIENCE

ExxonMobil Research and Engineering, Process Technology Dept. 2017-2020
Advanced Researcher

- Leading research on process intensification using membranes in the oil and gas industry.
- Process development for fuel products upgrading.
- Process intensification routes for syngas processing.

Rafael - Advanced Defense Systems, Missiles division 2007-2009
R&D Engineer

- Member of the largest and most advanced R&D group in Israel specializing in heat and mass transfer. Worked in a multidisciplinary group of engineers from the fields of Chemical, Mechanical and Aeronautical Engineering.
- Conducted diverse heat and mass transfer simulations of anti-ballistic missile systems.
- Planned, supervised and analyzed experiments to study the heat transfer in sophisticated electro-mechanical systems.
- Developed computational tools to simulate heat transfer in 2D-models.

Tower Semiconductors, FAB2 - Thin Films 2006-2007
Process engineering intern

- Lead process improvement experiments in the clean room.

ACADEMIC TEACHING EXPERIENCE

Technion I.I.T. - Chemical Engineering Dept. 2010-2015
Teaching Assistant in the following courses (# of semesters):

- Integrated Process Design Principles (5).
- Numerical Methods for Chemical Engineers (5).
- Fundamentals of Heat and Mass Transfer (4).
- Mathematical Modeling in Chemical Engineering(1).

Delivered lessons, prepared class presentations and exercises, home works, final projects and graded projects and exams.

Average score in teaching as graded by the students: 4.5/5.

- Successfully completed the *Kaufman Teaching Certificate Program*, MIT. 2017

PRESENTATIONS IN INTERNATIONAL CONFERENCES

- AIChE Annual Meeting, Minneapolis, MN, USA. 2017
- 27th ESCAPE, Barcelona, Spain. 2017
- EPIC6, Barcelona, Spain. *Invited speaker* 2017
- AIChE Annual Meeting, San Francisco - CA, USA. 2016
- AIChE Annual Meeting, Atlanta - GA, USA. 2014
- XXI International Conference on Chemical Reactors Engineering, Delft, the Netherlands. 2014
- 9th European Congress of Chemical Eng., Den Hague, the Netherlands. 2013
- I-core workshop, Dead Sea, Israel. 2013

HONORS AND AWARDS

- EFCE Excellence Award in Process Intensification (international). 2017
- Winner of a special scholarship for excellent PhD students, Chemical Engineering Dept., Technion (departmental). 2015
- EFCE best poster award presented in a special competition on *"Intensified Technologies for Multiphase Processes"*, 9th ECCE, den Hague (international). 2013
- *Fine* scholarship for outstanding Ph.D. students (institutional). 2013
- Prize for excellence in teaching, Technion (institutional). 2012
- *Leonard and Diane Sherman* interdisciplinary graduate school fellowship (institutional). 2011
- Excellence award, Rafael (institutional). 2009
- Rafael scholarship for distinguished undergraduate students (institutional). 2007
- *Intel* award for excellent undergraduate students (national). 2006