

CURRICULUM VITAE

Yitzchak yifrach (Senior Teacher)

December 2024

Work Address: Braude College, Department of Mechanical Engineering
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ACADEMIC DEGREES

M.Sc. 1991, Mechanical Engineering.
Faculty of Mechanical Engineering, Technion - Israel Institute of Technology, Haifa, Israel.
Dissertation: "Development of a specimen for fracture toughness measurement in brittle materials".
Advisors: Prof. J. Tirosh and Prof. E. Altus.

B.Sc. 1982, Mechanical Engineering.
Faculty of Mechanical Engineering, Technion - Israel Institute of Technology, Haifa, Israel.

ACADEMIC APPOINTMENTS

2022-2024 Member of the exemption based on practical engineering studies committee, Department of Mechanical Engineering, Braude College

2008-2024 **College of Engineering Karmiel , Israel.**
Nomination within Mechanical Engineering:
- Supervisor of Machine Design Element Project

2008-2023 **College of Engineering Karmiel , Israel.**
Nomination within Mechanical Engineering:
- Head of Design and Manufacturing studies

2013-2019 **College of Engineering Karmiel , Israel.**
Nomination within Mechanical Engineering:
- Consultant of the junior students of Mechanical Engineering

2010-2019 **College of Engineering Karmiel , Israel.**
Nomination within Mechanical Engineering:
- Consultant of the IDF students of direct B.Sc. degree Mechanical Engineering
- A member of the committee dealing with the interrelations between the college and the IDF.

2011-2017 **College of Engineering Karmiel , Israel.**
Nomination within Mechanical Engineering:
- Supervisor of Strength and Materials Laboratory

- 2014-2015 **College of Engineering Karmiel , Israel.**
 Nomination within Mechanical Engineering:
 - A member of the ABET ("the Accreditation Board for Engineering and Technology") Department work team.
 - A member of the EFQM (European foundation for quality management) Department work team.
- 2010-2014: **College of Engineering Karmiel , Israel.**
 Nomination within Mechanical Engineering: A member of the college Quality Management committee
- 2008-2013: **College of Engineering Karmiel , Israel..**
 Nomination within Mechanical Engineering:
 - A member of the college teaching committee
- 2008-2009: **College of Engineering Karmiel , Israel.**
 Nomination within Prof. Yohanan Arzi President, Braude College:
 - A member of the college committee for improvement of Students Tutoring.
- 2005-2009: **College of Engineering Karmiel , Israel.**
 Nomination within Mechanical Engineering:
 - A member of the faculty admission committee.
- 2003-2008: **College of Engineering Karmiel , Israel.**
 Nomination within Mechanical Engineering:
 - Consultant for the junior students of Mechanical Engineering
 - Supervisor of Machine Design Element Project
- 2003-2005: **College of Engineering Karmiel , Israel.**
 Nomination within Mechanical Engineering:
 - Chairman of the CIM Development committee.
- 1991-2001: **Nazareth Illit College, Israel.**
 - Head of Mechanical Engineering department and lecturer of Mechanical Engineering
- 1988-1991: **Technion - Institute of Technology, Haifa, Israel, and Faculty of Mechanical Engineering.**
 - Teaching Assistant

RESARCH INTERESTS

1. Prediction forces and temperature in milling processing processes by using finite element method and experiments.
2. Cutting dynamic force modeling of end milling operation
3. Mechanical design of machine elements
4. Analysis of machine parts elements by using simulations in finite element method
5. Fracture mechanics

TEACHING EXPERIENCE

- 1999-present
- College of Engineering Karmiel , Israel.
Mechanical Engineering Department**
- Undergraduate Courses:
- Introduction to Machine Design
 - Machine Design elements
 - Machine Design Element Project
 - Robotics
 - Machining processes of Metals
 - Engineering mechanics of solids
 - Computer Integrated Design and Manufacturing Systems
 - Strength and Materials Laboratory
- 2014- present
- Jerusalem College of Engineering – Azrieli, Israel.
Lecturer in Mechanical Engineering Department**
- Undergraduate Courses:
- Introduction to Machine Design.
 - Machine Design elements
 - Principles and analysis of machining manufacturing technologies
 - Kinematics of mechanical mechanisms
- 1999- 2015
- College of Engineering Karmiel , Israel.
Industrial Management Engineering Department**
- Undergraduate Courses:
- Materials and Mechanical Manufacturing Processes
- 1999-2007
- College of Engineering Karmiel , Israel.
Industrial Management Engineering Department**
- Undergraduate Courses:
- Computer Integrated Design and Manufacturing Systems
- 2003-2004
- College of Engineering Karmiel , Israel.
Electrical Engineering Department**
- Undergraduate Courses:
- Introduction to Robotics
- 1991-2001
- Nazareth Illit College, Israel.
Mechanical Engineering Department**
- Pre-Academic Courses:**
- Statics
 - Materials science for engineering
 - Strength of materials
 - Machine design
 - Supervisor of Machine Design Element Project
- Development of laboratories:
- Set-up and Teaching of strength of materials Lab

ACADEMIC AND PROFESSIONAL AWARDS

- 2017 **Jerusalem College of Engineering – Azrieli:**
An annual Excellence Certificate and Award for the year 2017
- 2017 **College of Engineering Karmiel , Israel:**
An annual Excellence Certificate and Award for the year 2016 based on survey and performance reps, which monitor all year-long teaching, and service achievements and effs.
- 2016 **College of Engineering Karmiel , Israel:**
An annual Excellence Certificate and Award for the year 2015 based on survey and performance reps, which monitor all year-long teaching, and service achievements and effs.
- 2014 **College of Engineering Karmiel , Israel:**
An annual Excellence Certificate and Award for the year 2013 based on survey and performance reps, which monitor all year-long teaching, and service achievements and effs.
- 2013 **College of Engineering Karmiel , Israel:**
An annual Excellence Certificate and Award for the year 2012 based on survey and performance reps, which monitor all year-long teaching, and service achievements and effs.
- 2013 **College of Engineering Karmiel , Israel:**
Second award for the best proposal for efficiency in Quality Management.
- 2013 **College of Engineering Karmiel , Israel:**
Award for representing the college in long distance running races.
- 2012 **College of Engineering Karmiel , Israel:**
An annual Excellence Certificate and Award for the year 2011 based on survey and performance reps, which monitor all year-long teaching, and service achievements and effs.
- 2012 **College of Engineering Karmiel , Israel:**
Award for the best proposal for efficiency in Quality Management.
- 2008 **College of Engineering Karmiel , Israel:**
An annual Excellence Certificate and Award for the year 2007 based on survey and performance reps, which monitor all year-long teaching, and service achievements and effs.
- 2006 **College of Engineering Karmiel , Israel:**
An annual Excellence Certificate and Award for the year 2005 based on survey and performance reps, which monitor all year-long teaching, and service achievements and effs.

2006

College of Engineering Karmiel , Israel:

Letter of distinction from the head of Industrial Management department, for completion the development and Upgrading the Computer Integrated Manufacturing (CIM) Lab.

1995, 1996, 1997

Nazareth Illit College:

3 Excellency awards for the improvement of the Mechanical and Air-Conditioning Department.

1983, 1986

Israel Aircraft Industry (IAI):

2 Excellency awards for working out technical solution leading to weight reduction of components on the Canard (small wing) of the Lavi Combat Aircraft project.

RESEARCH SUPER VISION

- ❖ Supervised two undergraduate students, College of Engineering Karmiel: Department of Mechanical Engineering, Israel, 2015-2016 (Omer Levy, & Elad Yehuda)
- ❖ Supervised one undergraduate student, College of Engineering Karmiel: Department of Mechanical Engineering, Israel, Department of Mechanical Engineering, Israel, 2016-2017 (Mor Elgarisi)
- ❖ Supervised one undergraduate student, College of Engineering Karmiel: Department of Mechanical Engineering, Israel, 2017-2018 (Ido Salem)
- ❖ Supervised one undergraduate student, College of Engineering Karmiel: Department of Mechanical Engineering, Israel, 2018-2019 (Kobi Ben Dahan)
- ❖ Supervised one undergraduate student, College of Engineering Karmiel: Department of Mechanical Engineering, Israel, 2018-2019 (Liel Shema)
- ❖ Supervised one undergraduate student, College of Engineering Karmiel: Department of Mechanical Engineering, Israel, 2018-2019 (Erez Dahan)
- ❖ Supervised one undergraduate student, College of Engineering Karmiel: Department of Mechanical Engineering, Israel, 2021-2022 (Yahav Alon)
- ❖ Supervised one undergraduate student, College of Engineering Karmiel: Department of Mechanical Engineering, Israel, 2021-2022 (Or Books)
- ❖ Supervised one undergraduate student, College of Engineering Karmiel: Department of Mechanical Engineering, Israel, 2022 (Gal Peretz)
- ❖ Supervised one undergraduate student, College of Engineering Karmiel: Department of Mechanical Engineering, Israel, 2024 (Yarden Elkayam)

PROFESSIONAL EXPERIENCE

- 1993-present: Freelancer consultant. Computerized and analytical structure and strength analysis with the aid of finite element model software (ANSYS). A partial list of projects carried out during this period is attached.
- 1999 Consulting: Development of teaching program for undergraduate Courses in Statics, Dynamics, and Fluid mechanics.
Customer: Ministry of Work, Israel.
- 1999 Consulting: Thermal analysis for an antenna unit.
Customer: Celletra, Yoqne'am Israel. May 1999.
- 1995 Final rep on program that carries out transformation on data files containing elevation points of whole Israel. The purpose of the program is to create files of 1degree * 1degree with a 3" grid, by carrying out interpolation to calculate the required point whilst knowing 4 points in that surrounding area.
Customer: Qualcomm Israel, Haifa
- 1992 Consulting: The behavior of stress intensity factor K1 on a channel beam with a variable length crack caused by a unidirectional compression load.
Customer: Prof. J. Tirosh, Faculty of Mechanical Engineering, Technion - Israel Institute of Technology, Haifa Israel. April 1992.
- 1992 Consulting: Analysis of stiffness and strength of composite material plates under bending load.
Customer: Prof. E. Altus, Faculty of Mechanical Engineering, Technion - Israel Institute of Technology, Haifa Israel. Feb 1992.
- 1991 Consulting: Effect of a soft layer on the stress intensity factor K1 of a transverse crack caused by a vertical compression load.
Customer: Prof. M. Livne, Faculty of Structural Engineering, Technion - Israel Institute of Technology, Haifa Israel. Sep 1991.
- 1982-1988: Structural strength engineering, encompassing analysis, modeling, and testing of the Canard (small wing) and elements of the wing, in the framework of the IAI Lavi Combat Aircraft project. These structures are composed of metal and composite material structural elements. Stiffness, strength, manufacturing processes, weight, and price were analyzed for optimization using both analytical and numerical Methods. A finite element model (FEM) of the entire Canard was constructed by using NASTRAN software package. Within that I also took part in planning and testing canard and wing prototypes.

REFEREED JOURNAL PAPERS:

1991 Tirosh, J., Altus, E., Yifrach, Y., 1992, "A new method for evaluating fracture toughness of brittle materials", Int. J. Fracture 58:211-222.

PLENARY AND INVITED TALKS AT CONFERENCES

National Conference Presentations:

Oct 2024

Yitzchak Yifrach

Prediction of cutting forces and temperatures in dry end milling operation of steel by experiments and Numerical modeling (FEM)

First tribology conference - Tri Bio - Azrieli College of Engineering – October 29.10.2024. Jerusalem, Israel

Oct 2019

Yitzchak Yifrach*, Koby Ben Dahan, Erez Dahan

Prediction Temperature and heat partition on tool-workpiece interface during slot milling of SAE1020 by using a experiments and finite elements simulations.

The 15th Interdisciplinary Research Conference Braude College
October 23-24, 2019, Pastoral Hotel, Kfar Blum, Israel

Oct 2018

Yitzchak Yifrach*, Mor Elgarisi:

Development of cutting force and cutting power prediction program by finite element method (FEM) and experimental investigation for predicting cutting zone temperature in micro end milling machining of metals.

The 14th Interdisciplinary Research Conference Braude College
October 17-18, 2018, Pastoral Hotel, Kfar Blum, Israel

Oct 2017

Yitzchak Yifrach*, Mor Elgarisi:

Developing a finite element model for predicting cutting zone temperature in micro-Grinding of ceramics and in slot (micro end milling) of Aluminum 6061-T6

The 13th Interdisciplinary Research Conference Braude College
October 25-26, 2017, Nahsolim Seaside Res, Israel

Oct 2017

Yitzchak Yifrach*, Mor Elgarisi: **Developing a finite element model for predicting cutting zone temperature in micro slot Grinding of ceramics and in slot (micro end milling) of Aluminum 6061-T6**

The 13th Interdisciplinary Research Conference Braude College
October 25-26, 2017, Nahsholim Seaside Res, Israel

Sep 2016

Yitzchak Yifrach*, Omri Levi, Elad Yehouda:

Finite Element Model (FEM) Development and analyzing in end-milling process for cutting zone temperature prediction for metals and ceramic materials.

The 12th Interdisciplinary Research Conference Braude College
September 28-29, 2016, Hagoshrim Hotel, Upper Galilee, Israel

Erasmus Conference Presentations

June 2022

Participation in the Erasmus Conference from 30 May to 3 June at the University of Leoben, Austria. During the conference I gave two seminars to Prof. Paul O'Leary (Chair of Automation University of Leoben) and his team in the following topics:

1. Prediction of cutting forces and temperatures in dry end milling operation in low carbon steel (SAE 1020) by experiments and modeling
2. Prediction temperatures in dry end milling operation dry end milling operation in low carbon steel (SAE 1020) by experiments and modeling

Oct 2018

Participation in the Erasmus Conference from 19 October to 26 October at the University of Vidzeme Valmiera, Latvia. During the conference I gave two lectures:

1. Mechanisms of fatigue failure of materials and structures
2. Development a thermal-mechanical model in finite element method for predicting temperature and forces in the cutting zone by machining metals.

Refereed Conference Proceedings:

August 2024

Yitzchak Yifrach :

" Finite element modeling for predicting Stress intensity factor (SIF) for mode I in brittle material (wc+co) under uniaxial compression or uniaxial displacement."

European Conference on Fracture 2024 August 26–30, 2024, Zagreb, Croatia

June 2023

Yitzchak Yifrach :

"Finite element modeling for predicting optimal hole profile in a finite square plate of heterogeneous brittle material (wc+co) under uniaxial compression or uniaxial displacement."

15th International Conference on Fracture June 11–16, 2023, Atlanta, Georgia, USA

May 2023

D. Ninevski, Y. Yifrach, P. O'Leary.:

Instrumented Milling Process and Analysis for Tool Wear Measurement.

I2MTC 2023 Instrumentation and Measurement , May 22–25, 2013, Kuala Lumpur Convention Centre, Malaysia.

June 2013

Yitzchak Yifrach*, Uri Ben-Hanan.:

Cutting zone temperature and specific cutting energy measurement and evaluation in machining Metals and ceramic.

13th International Conference on Fracture June 16–21, 2013, Beijing, China

International academic and research cooperation

Dec 2006

Visiting the department of Mechanical Engineering at the Indian Institute of Technology Guwahati to check academic and research cooperation with the Braude College. December 2006, Guwahati, India

TEXTBOOKS (IN HEBREW) FOR BRAUDE COURSES

2005	Y. Yifrach, Introduction to Machine Design, 2005
2005	Y. Yifrach, Manufacturing Machining Processes, 2005
2005	Y. Yifrach, Machine Design, 2005
2004	Y. Yifrach, Manufacturing Process, 2004
2003	Y. Yifrach, Robotics, 2003
2001	Y. Yifrach, Computer Integrated Manufacturing (CIM), 2001

SELECTED LIST OF CONSULTING PROJECTS

April 1999	Development of teaching program for undergraduate Courses in Statics, Dynamics, and Fluid mechanics. Customer: Ministry of Work, Israel
May 1999	Thermal analysis for an antenna unit. Customer: Celletra, Yoqne'am Israel.
May 1993	The behavior of stress intensity factor K1 in ceramic square plate with a central hole with a variable length crack caused by a unidirectional compression load. Customer: Prof. E. Altus, and J. Tirosh, Faculty of Mechanical Engineering, Technion - Israel Institute of Technology, Haifa Israel.
January 1995	Final rep on program that carries out transformation on data files containing elevation points of whole Israel. The purpose of the program is to create files of 1degree * 1degree with a 3" grid, by carrying out interpolation to calculate the required point whilst knowing 4 points in that surrounding area. Customer: Qualcomm Israel, Haifa
April 1992	The behavior of stress intensity factor K1 on a channel beam with a variable length crack caused by a unidirectional compression load. Customer: Prof. J. Tiros, Faculty of Mechanical Engineering, Technion - Israel Institute of Technology, Haifa Israel.
Sep 1991	Effect of a soft layer on the stress intensity factor K1 of a transverse crack caused by a vertical compression load. Customer: Prof. M. Livne, Faculty of Structural Engineering, Technion - Israel Institute of Technology, Haifa