

## ► **An Afternoon Talk on Bones, Doctors and High Order Finite Element Methods**

Predicting the mechanical response of human bones is of major clinical importance for diagnostic purposes as well as for treatment. Patient-specific bone simulations are being described which involve the combination of high order finite element (FE) methods, medical imaging and experimental observations.

We apply deep learning technology to quantitative computerized tomography (qCT) scans to generate subject-specific bone computerized models, which are loaded by physiological loads according to patient's weight. A high order finite element simulation can then predict bone's mechanical response and determine the risk and location of fracture. Verification of these simulations and their validation by a large set of experiments will be presented. This new technology allows orthopedic surgeons to plan a proper patient specific treatment.

Clinical examples of the use of our simulations in clinical practice for treatment of patients with metastatic bone tumors will be provided.



### ► **Prof. Zohar Yosibash**

Head, Computational Mechanics and Experimental Biomechanics Labs  
School of Mechanical Engineering  
Tel Aviv University

Prof. Yosibash received his B.Sc. in Aeronautical Engineering from the Technion (87), his M.Sc. in Applied Mathematics from Tel-Aviv University (92) and D.Sc. in Mechanical Engineering from Washington University, St. Louis, USA (94). He joined Ben-Gurion University in 1995 and since 2008 he is a full professor of mechanical engineering. He has been a visiting professor at Brown Univ. from 2002-2007, and at the Technical Univ. of Munich during 2010-2011. He received the Toronto prize for excellence in research at BGU in 2009. Prof. Yosibash was a Hans Fischer Senior Fellow at the Institute for Advanced Study at the Technical University of Munich (2009-2012) and serves as the scientific ambassador since 2013. Since 2015 he serves as the president of the Israel Association for Computational Methods in Mechanics.

Prof. Yosibash joined the School of Mechanical Engineering at TAU in Oct 2017. He is the head of the lab for computational mechanics and experimental biomechanics at TAU.

## ► **Wednesday, March 28, 2018 at 16:30** (gathering at 16:00)

Faculty of Aerospace Engineering, Library classroom (room 165)

► Light refreshments will be served before the lecture.