

Curriculum Vitae

Name: **Nir Trabelsi**

Date & place of birth: March 27, 1979, Beer Sheve, Israel.

Citizenship: Israeli

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1. Academic education

2007-2011 Ph.D. Ben-Gurion University of the Negev, Beer-Sheva, Israel (BGU).
Thesis: Mechanical response of the proximal femur - Finite element analyses validated by experimental observations.

2005-2007 M.Sc. in Mechanical Engineering. Ben-Gurion University of the Negev, Beer-Sheva, Israel.

2001-2005 B.Sc. in Mechanical Engineering. Ben-Gurion University of the Negev, Beer-Sheva, Israel.

2. Academic employment

Since 2011 Senior Lecturer, Department of Mechanical Engineering, Shamoon College of Engineering (SCE), Beer-Sheva, Israel.

Courses:

- Strength of Materials
- Engineering Design using Finite Element Analysis
- Product design & development
- Computer graphics
- Final Engineering Project
- Anatomy, Physiology and Biomechanics

Since 2017 Head of the Center for Thermo-Mechanics and Failure of Materials – CTMFM at SCE.

2005-2011 Lecturer and teaching assistant at Ben-Gurion University of the Negev, Beer-Sheva, Israel in the following departments: Mechanical Engineering, Industrial Engineering & Management and Biomedical Engineering.

3. Industrial engineering experience

2016– Current Founder & Chief Engineering Analyst, PerSimiO (Startup company). R&D Team, Image processing, deep learning, biomechanics, Finite Element Analysis and Product design.

2004-2005 HP-Indigo, Engineering Department. New Product Introduction team member - Spare parts packages design and support. Technical reports disassembling and assembly of machines.

2004 Orbotech, Engineering Department. Items cataloging according to international standards.

4. Academic research and development activities

4.1. Previous research and development activities

2005-2011 Computational mechanics laboratory BGU. Finite element analysis, Mechanical experiments, CT and Image processing, CAD.

2004-2005 Shock Waves Laboratory, BGU.

- Investigation of the mechanical response of safety glass-Dynamic and static mechanical experiments

4.2. Present research and development activities

Since 2011 Department of Mechanical Engineering – Sami-Shamoon College of Engineering, Beer-Sheva, Israel.

- Thermo-Mechanics and Failure of Materials – Head of research center
- Computational biomechanics method in clinical application
- Mechanical response of the proximal femur - Finite element analyses validated by experimental observations
- Renewable Energy- Discreet Energy production, Sea waves power production system
- Product development

5. Grants and awards

5.1. Grants

2004 Head of Department excellence award-BGU.

2007 Yahakov Ben-Yitshak Acohen Award-BGU.

2007 Tzin scholarship (2007-2011).

2009 1st place in the IACMM Lecture Competition.

2012-2015 Trabelsi, N. (SCE – Shamoon College of Engineering). Computational biomechanics method in clinical application. Internal Grant

- 2017 Trabelsi, N., Priel E., Equal Channel Angular Extrusion (ECAE). REFAEL, Industry research grant.
- 2017-2018 Trabelsi, N., Priel E. Thermo-mechanics and failure of material. NRCN, Industry research grant.
- 2018-2020 Trabelsi, N., Priel E. Thermo-mechanics and failure of material. NRCN, Industry research grant.

6. List of publications

6.1. Peer reviewed papers

1. H. Schermann, Y. Gortzak, Y. Kollender, S. Dadia, N. Trabelsi, Z. Yosibash, A. Sternheim, 2020. Patient-specific computed tomography-based finite element analysis: a new tool to assess fracture risk in benign bone lesions of the femur. *Clinical Biomechanics* 80, 105155
2. E. Priel, N. Navi, B. Mittelman, N. Trabelsi, M. Levi, S. Kalabukhov, S. Hayun, 2020. Cold Forming of Al-TiB₂ Composites Fabricated by SPS: A Computational Experimental Study. *Materials* 13 (16), 3456
3. Amir Sternheim, Frank Traub, Nir Trabelsi, Solomon Dadia, Yair Gortzak, Nimrod Snir, Malka Gorfine, Zohar Yosibash, 2020. When and where do patients with bone metastases actually break their femurs? a CT-based finite element analysis. *The Bone & Joint Journal*, 102(5), 638-645.
4. Zohar Yosibash, Kent Myers, Nir Trabelsi, Amir Sternheim, 2020. Autonomous FEs (AFE)-A stride toward personalized medicine. *Computers & Mathematics with Applications*. (In Press) available online since April 2020,
5. Gal Dahan, **Nir Trabelsi**, Ori Safran, Zohar Yosibash, 2019. Finite element analyses for predicting anatomical neck fractures in the proximal humerus. *Clinical Biomechanics* 68, 114-121.
6. E. Priel, B. Mittelman, **N. Trabelsi**, Y. Cohen, Y. Koptiar, R. Padan, 2019. A computational investigation of Equal Channel Angular Pressing of molybdenum validated by experiments. *Journal of Materials Processing Technology* 264, 469-485
7. Amir Sternheim, Ornit Giladi, Yair Gortzak, Michael Drexler, Moshe Salai, **Nir Trabelsi**, Charles Milgrom, Zohar Yosibash, 2018. Pathological fracture risk assessment in patients with femoral metastases using CT-based finite element methods. A retrospective clinical study. *BONE* 110, 215-220.
8. Y. Cohen, I. Avivi, Z. Yosibash, **N. Trabelsi**, H. Sherman, A. Sternheim, 2017, Novel CT-Based Bone Strength Assessment By Finite Element Analysis for Monitoring Bone Involvement in Myeloma: a Proof of Concept Study, *Blood* 130 (Suppl 1), 3143-3143

9. Gal Dahan, **Nir Trabelsi**, Ori Safran, Zohar Yosibash, 2016. Verified and validated finite element analyses of humeri. *J. Biomechanics* 49, 1094-1102.
10. Zohar Yosibash, Romina Plitman Mayo, Gal Dahan, **Nir Trabelsi**, Amir Gail, Charles Milgrom, 2014. Predicting the stiffness and strength of human femurs with realistic metastatic tumors. *Bone*, **69**, pp. 180-190.
11. **Nir Trabelsi**, Charles Milgrom and Zohar Yosibash, 2014. Patient-Specific FE Analyses of Metatarsal Bones with Inhomogeneous Isotropic Material Properties. *Journal of the Mechanical Behavior of Biomedical Materials*, 29, 177-189.
12. Martin Ruess, David Tal, **Nir Trabelsi**, Zohar Yosibash, Ernst Rank, 2012. The finite cell method for bone simulations: verification and validation. *Biomechanics and Modeling in Mechanobiology*, 11 (3-4), 425-437.
13. **Nir Trabelsi** and Zohar Yosibash, 2011. Patient-specific FE analyses of the proximal femur with orthotropic material properties validated by experiments. *J. Biomechanical Engineering*, 133, 061001-1-061001-11.
14. **Nir Trabelsi**, Zohar Yosibash, Christof Wutte, Peter Augat and Sebastian Eberle, 2011. Patient-specific finite element analysis of the human femur - A double-blinded biomechanical validation. *J. Biomechanics* 44 (9), 1666-1672.
15. Zohar Yosibash, David Tal and **Nir Trabelsi**, 2010. Predicting the yield of the proximal femur using high-order finite-element analysis with Inhomogeneous orthotropic material properties. *Phil. Trans. R. Soc. A* 368, 2707-2723.
16. **Nir Trabelsi**, Zohar Yosibash, and Charles Milgrom, 2009. Validation of subject-specific automated p-FE analysis of the proximal femur. *J. Biomechanics* 42, 234-241.
17. Zohar Yosibash, **Nir Trabelsi** and Christian Hellmich, 2008. Subject-specific p-FE analysis of the proximal femur utilizing micromechanics based material properties. *International Journal for Multiscale Computational Engineering* 6 (5), 483-498.
18. Zohar Yosibash, **Nir Trabelsi** and Charles Milgrom, 2007. Reliable simulations of the human proximal femur by high-order finite element analysis validated by experimental observations. *J. Biomechanics* 40, 3688-3699.

Books/collective volumes

6.1.1. Chapters in books

1. Yosibash, Z. and **Trabelsi, N.** Reliable Patient-Specific Simulations of the Femur. In *Patient-Specific Modeling in Tomorrow's Medicine*, A. Gefen Editor, Springer, ISBN 978-3-642-24617-3, pp. 3-26 (2012).

6.2. Papers and abstracts – proceedings of conferences

6.2.1. Invited conference plenary lectures

1. Trabelsi, N, 2017, CT-based finite element analysis for predicting contralateral hip fractures, VII International Conference on Coupled Problems in Science and Engineering, Rhodes Island, Greece 12 - 14 June, 2017
2. Trabelsi, N. Patient-specific finite element analysis of the long bones – application in clinical practice, 11th World Congress on Computational Mechanics (WCCM XI), July 2014, Barcelona, Spain (invited lecture by the organizers).
3. Trabelsi, N. Patient-specific finite element analysis of the human femur – validation by experiments and possible applications in clinical practice, ISTAM Annual Symposium, December 2012, Tel Aviv University, Israel.
4. Trabelsi, N. Patient-specific simulation of femur's mechanical response validated by experimental observations. Bone simulation, experiments and their application in clinical practice, November, 2010, Gerching, Germany.
5. Trabelsi, N. Patient-specific simulation of the proximal femur's mechanical response validated by experimental observations. The 25th Israel Symposium on Computational Mechanics, October, 2008, Ben-Gurion University, Beer-Sheva, Israel.
6. Trabelsi, N. Patient specific simulation of the proximal femur's mechanical response validated by experimental observations. ISTAM Annual Symposium, December, 2007, Tel Aviv University, Israel.
7. Trabelsi, N. p-FE analysis of the human proximal femur compared to in-vitro experiments. The 20th Israel Symposium on Computational Mechanics (ISCM-20), May, 2006, Tel-Aviv University, Israel.
8. Trabelsi, N. The behavior of safety glass under dynamic load. The 30th Israeli conference of mechanical engineering, May, 2005, Tel-Aviv, Israel.

6.2.2. Contributed conference & poster presentations

1. Z. Yosibash, K. Myers, N. Trabelsi, Computational bone –mechanics augmented by machine learning - A leap to clinical practice, 25th Congress of the European Society of Biomechanics, Vienna, Austria, July 2019.

2. Z. Yosibash, K. Myers, N. Trabelsi, Computational bone –mechanics augmented by machine learning - A leap to clinical practice, International Conference on Coupled Problems in Science and Engineering, Barcelona, Spain, June 2019.
3. Z. Yosibash, N. Trabelsi, CT-based Autonomous FEs (AFE) A leap to clinical practice, Higher Order Finite Element and Isogeometric Methods (HOFEIM), Pavia, Italy, May 2019.
4. Z. Yosibash, N. Trabelsi, Moshe Salai and A. Sternheim, Pathological fracture risk assessment in patients with femoral metastases using CT-based finite element methods. A retrospective clinical study, ICTB III International Conference on Biomedical Technology, Hannover, Germany, Nov 2017.
5. Z. Yosibash, N. Trabelsi and A. Sternheim, FEA applications in clinical orthopaedic oncology - Patient-specific quantitative fracture risk assessment in patients with metastatic tumors in their femur, VII International Conference on Coupled Problems in Science and Engineering, Rhodes Island, Greece, June 2017.
6. A. Sternheim, Y. Gortzak, S. Dadia, N. Trabelsi, Z. Yosibash, Novel CT Based Mechanical Strength Analysis of the Femur Gives Patient Specific Quantitative Insight of Bone Pathology and Impending Pathologic Fracture Risk, ISOLS, The 19th International Society of Limb Salvage , Japan, May 2017.
7. N. Trabelsi, Z. Yosibash, A. Sternheim, Patient-specific high order finite element analysis of long bones - possible applications in clinical practice. Higher Order Finite Element and Isogeometric Methods (HOFEIM), Jerusalem, Israel, May 2016.
8. Z. Yosibash, N. Trabelsi, M. Salai, p-FEA of femurs: A leap to orthopaedic practice. The 5th Israeli Conference on Robotics, Herzliya, Israel, April 2016.
9. N. Trabelsi. Reliable patient-specific p-FEM simulation of Femur's mechanical response, Higher Order Finite Element and Isogeometric Methods (HOFEIM), Krakow, Poland, June 2011.
10. N. Trabelsi. p-FE investigation on the influence of isotropic or anisotropic material models on the mechanical response of the proximal femur. IV International Congress on Computational Bioengineering (ICCB2009), Bertinoro, Italy, September 2009.
11. N. Trabelsi. p-FE analysis of the proximal femur. International Workshop on High-Order Finite Element Methods, Herrsching, Germany, May, 2007.

6.2.3. Seminar presentations

N. Trabelsi. Patient-Specific Mechanical Response of the Proximal Femur - Finite Element Analyses Validated by Experimental Observations, Seminar, Department of Mechanical Engineering December 2011, BGU, Israel.

6.3. Patents

1. Z. Yosibash, N. Trabelsi, K. Myers, C. Milgrom. Automated patient-specific method for biomechanical analysis of bone. Grant - US application no. 15/027,701. 1185-Y-01-US1, 2018.
2. Z. Yosibash, Book Gilad, N. Trabelsi. Automated bone segmentation in images. PCT International Application, PCT/IL2019/050274, Priority date: March 12, 2018.

7. Academic roles

Senior Lecturer at SCE

Since 2017 Head of the Center for Thermo-Mechanics and Failure of Materials – CTMFM at SCE.

Since 2011 Final project Supervisor, SCE.

Since 2018 M.A students Supervisor, SCE.

Since 2015 Final project coordinator at SCE mechanical Eng. Department.

Since 2016 Fourth-year Academic Advisor, SCE.

Since 2014 Chairmen of Departmental Teaching Committee, SCE.

8. Editorial roles

8.1. Manuscripts reviewer

Since 2013 Journal of Biomechanics.

Since 2015 Mathematical Problems in Engineering

9. Positions in conferences

9.1 Mini symposium chairman, VII International Conference on Coupled Problems in Science and Engineering, Rhodes, 2017

9.2 Conference Organizer, The 41th Israel Symposium on Computational Mechanics (ISCM-41), Beer Sheava, Israel, Sep, 2016.

10. Membership in professional/scientific societies

Since 2011 IACMM - Israel Association for Computational Methods in Mechanics.