


## CURRICULUM VITAE

# Seyyed Hamed Hosseini Nasab

<b>Contact Information</b>	Witikonerstrasse 489 8053 Zürich Switzerland E-Mail: seyed.hosseini@hest.ethz.ch Phone: +41796273284	
<b>Nationality</b>	Iranian (Swiss B residence permit)	
<b>Date of Birth</b>	23.09.1977	

## Education

2014-November 2019	<b>ETH Zürich, Switzerland</b> <b>Laboratory for Movement Biomechanics</b> PhD in Biomechanics: "Taking the Strain: Understanding functionality of the Knee Ligaments before and after Total Knee Arthroplasty", supervised by Prof. William R. Taylor
1999-2001	<b>Sharif University of Technology, Iran</b> <b>Mechanical Engineering Department</b> MSc. in Biomedical Engineering
1995-1999	<b>Ferdowsi University of Mashhad, Iran</b> <b>Mechanical Engineering Department</b> BSc. in Mechanical Engineering

## Work experience

2019-current	<b>ETH Zürich, Switzerland</b> <b>Laboratory for Movement Biomechanics</b> Group leader-Computational Biomechanics (since Jan 2021) Postdoctoral researcher (2019-2022)
2014-2019	<b>ETH Zürich, Switzerland</b> <b>Laboratory for Movement Biomechanics</b> Scientific assistant (full time)
2002-2014	<b>Azad University of Birjand, Iran</b> <b>Mechanical Engineering Department</b> Full-time lecturer (2002-2014) Head of the Mechanical Engineering Department (2006-2014) Head of the material testing lab (2003-2014) Head of the welding-metallurgy workshop (2006-2014)

## Teaching Experience

2017-current	<b>ETH Zürich, Switzerland</b> Lecturer (Scientific writing, reporting and communication 30%) Teaching assistant (Sport Biomechanics) Teaching assistant (Clinical and Movement Biomechanics)
2002-2014	<b>Azad University of Birjand, Iran</b> Lecturer (several course units including “Statics and dynamics of structures”, “Design of machine elements”, “Mechanics of materials”, and “Fluid mechanics 1 & 2”)
1997-1999	<b>Ferdowsi University of Mashad, Iran</b> Teaching assistant (Machine dynamics)

## Awards

<ul style="list-style-type: none"><li>▪ Best poster presentation at ICBME 2022, Tehran, Iran: “IMU-Based Estimation of the Knee Contact Force Using Artificial Neural Networks” by: Rezaie Zangene A., Abedi Azar R., Naserpour H., and <b>Hosseini Nasab S.H.</b></li><li>▪ European Society of Biomechanics SM Perren Award 2022, for the best scientific paper: “Standardized tibio-femoral implant loads and kinematics. <i>Journal of Biomechanics</i>, 141, 111171, 2022” by: Dreyer M, Trepczynski A, <b>Hosseini Nasab S H</b>, Kutzner I, Schütz P, Weisse B, Dymke J, Postolka B, Moewis P, Bergmann G, Duda GN, Taylor WR, Damm P, and Smith CR.</li><li>▪ IAU best teacher award, by the governing board of the Azad University of Birjand, 2008, 2009, 2013</li><li>▪ Best academic research award, by the research committee of the Azad University of Birjand for the project entitled: “Defining boundaries of the safe range of human activities: A biomechanical study”, 2005</li><li>▪ Elite master student of the year, by the Iranian Ministry of Science (awarded to only 20 students across the entire country), 2001</li><li>▪ Achieved the highest GPA across all students of the Biomedical Engineering program, Sharif University of Technology, 2001</li><li>▪ Achieved the second highest GPA across all students of the Mechanical Engineering Department, Ferdowsi University of Mashad, 1999</li></ul>
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## Received Grants

<ul style="list-style-type: none"><li>▪ Financial support from Aesculap AG. (Tuttlingen, Germany) to develop and validate a predictive musculoskeletal simulation framework for preclinical evaluation of the knee implants (2022-2023)</li><li>▪ Financial support from Aesculap AG. (Tuttlingen, Germany) for the project entitled: “Understanding the influence of implant alignment parameters on loading and movement patterns of the knee after Total Knee Arthroplasty” (2021-2022)</li><li>▪ Financial support from Aesculap AG. (Tuttlingen, Germany) for developing full body subject-specific musculoskeletal models for subjects measured within the CAMS-Knee project (2020-2021)</li><li>▪ Financial support from Aesculap AG. (Tuttlingen, Germany) for the project entitled: “Development and validation of a Finite Element modelling framework to predict motion of the knee joint after Total knee Arthroplasty” (2019-2020)</li><li>▪ Financial support from Aesculap AG. (Tuttlingen, Germany) for validation of the Aesculap Finite Element modelling pipeline to assess functionality of different knee implants (2018-2019)</li><li>▪ Scholarship from Iranian Ministry of Science for my PhD: Understanding Functionality of the Knee Ligaments before and after Total Knee Arthroplasty (2014-2019)</li></ul>
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**Researchgate Profile:** <https://www.researchgate.net/profile/Seyyed-Hamed-Hosseini-Nasab>

### Selected publications since 2016

#### Published in Peer-reviewed Journals

- **Hosseini Nasab S. H.**, Smith CR, Maas A, Vollenweider A, Dymke J, Schütz P, Damm P, Trepczynski A and Taylor WR (2022). Uncertainty in Muscle–Tendon Parameters can Greatly Influence the Accuracy of Knee Contact Force Estimates of Musculoskeletal Models. *Front. Bioeng. Biotechnol.* 10:808027. doi: 10.3389/fbioe.2022.808027
- Dreyer, M. J., Trepczynski, A., **Hosseini Nasab, S. H.**, Kutzner, I., Schütz, P., Weisse, B., ... & Smith, C. R. (2022). **European Society of Biomechanics SM Perren Award 2022:** Standardized tibio-femoral implant loads and kinematics. *Journal of Biomechanics*, 141, 111171.
- **Hosseini Nasab, S. H.**, Smith, C. R., Postolka, B., Schütz, P., List, R., & Taylor, W. R. (2021). In Vivo Elongation Patterns of the Collateral Ligaments in Healthy Knees During Functional Activities. *JBJS*, 10-2106.
- Zhang, Q., Adam, N.C., **Hosseini Nasab, S.H.** et al. (2021). Techniques for In Vivo Measurement of Ligament and Tendon Strain: A Review. *Ann Biomed Eng* 49, 7–28. <https://doi.org/10.1007/s10439-020-02635-5>.
- Huber, C., Zhang, Q., Taylor, WR., Amis, AA., Smith, C. and **Hosseini Nasab, S. H.** (2020). Properties and Function of the Medial Patellofemoral Ligament: A Systematic Review. *The American journal of sports medicine*, p.0363546519841304. **(29 citations since 2020)**
- **Hosseini Nasab, S. H.**, Smith, C., Schütz, P., Postolka, B., Ferguson, S., Taylor, W. R., & List, R. (2020). Elongation patterns of the posterior cruciate ligament after total knee arthroplasty. *Journal of clinical medicine*, 9(7), 2078.
- Sayers MGL, **Hosseini Nasab S. H.**, Bachem C, Taylor WR, List R, Lorenzetti S. (2020). The effect of increasing heel height on lower limb symmetry during the back squat in trained and novice lifters. *BMC Sports Sci Med Rehabil.* doi: 10.1186/s13102-020-00191-y.
- **Hosseini Nasab, S. H.**, Smith, C. R., Schütz, P., Damm, P., Trepczynski, A., List, R., & Taylor, W. R. (2020). Length-change patterns of the collateral ligaments during functional activities after Total knee Arthroplasty. *Annals of biomedical engineering*, 48(4), 1396-1406.
- Sayers MGL, Bachem C, Schütz P, Taylor WR, List R, Lorenzetti S, **Hosseini Nasab S. H.** (2020). The effect of elevating the heels on spinal kinematics and kinetics during the back squat in trained and novice weight trainers. *J Sports Sci.* 38(9):1000-1008. doi: 10.1080/02640414.2020.1738675.
- Nejad, Z. I., Khalili, K., **Hosseini Nasab, S. H.**, Schütz, P., Damm, P., Trepczynski, A., ... & Smith, C. R. (2020). The capacity of generic musculoskeletal simulations to predict knee joint loading using the CAMS-knee datasets. *Ann Biomed Eng*, 48(4), 1430-1440.
- **Hosseini Nasab, S. H.**, Smith, CR., Schütz, P., Postolka, B., List, R., and Taylor, WR. (2019). Elongation Patterns of the Collateral Ligaments after Total Knee Arthroplasty are Dominated by the Knee Flexion Angle. *Frontiers in Bioengineering and Biotechnology*, Published Ahead-of-Print, doi: 10.3389/fbioe.2019.00323.
- Ignasiak, NK., Ravi, DK., Orter, S., **Hosseini Nasab, S. H.**, Taylor, WR. and Singh, NB. (2019). Does variability of footfall kinematics correlate with dynamic stability of the centre of mass during walking? *PLoS one*, 14(5), p.e0217460.
- Taylor, WR., Schütz, P., Bergmann, G., List, R., Postolka, B., Hitz, M., Dymke, J., Damm, P., Duda, G., Gerber, H., Schwachmeyer, V., **Hosseini Nasab, S. H.**, Trepczynski, A., Kutzner, I. (2017). A comprehensive assessment of the musculoskeletal system: the CAMS-knee data set, *Journal of biomechanics*, 65, 32-39. **(59 citations since 2017)**
- Oberhofer, K., **Hosseini Nasab, S. H.**, Schütz, P., Postolka, B., Snedeker, JG., Taylor, WR. and List, R. (2017). The influence of muscle-tendon forces on ACL loading during jump landing: a systematic review. *Muscles, Ligaments and Tendons Journal*, 7(1), p.125.
- **Hosseini Nasab, S. H.**, List, R., Oberhofer, K., Fucntese, SF., Snedeker, JG. and Taylor, WR. (2016). Loading patterns of the posterior cruciate ligament in the healthy knee: a systematic review. *PLoS one*, 11(11), p.e0167106.

## Selected oral conference presentations since 2016

- Using video fluoroscopy together with combined musculoskeletal and finite element modelling to assess the impact of implant design on in vivo contact mechanics in total knee arthroplasty, WCB 2022, Taipei, Taiwan.
- In vivo contact mechanics in total knee arthroplasty is governed by the implant conformity, ESB 2022, Porto, Portugal.
- In Vivo Length-Change Patterns of the Medial Collateral Ligament Throughout Complete Cycles of Level Walking, ISB 2021, Stockholm, Sweden.
- Uncertainty in Muscle-Tendon Parameters Can Greatly Influence the Accuracy of Knee Contact Force Estimates of Musculoskeletal Models, CMBBE 2021, Bonn, Germany.
- Novel Implant Wear Testing Boundary Conditions Derived from Moving Fluoroscopy and Instrumented Implant Measurements, ORS 2020.
- Assessment of Collateral Ligament Function following Total Knee Arthroplasty using Mobile Video Fluoroscopy, TGCS 2019, Canmore, Canada.
- Activity Dependent External Joint Moments Influence Knee Mechanics During Functional Movements, ESB 2019, Vienna, Austria.
- Elongation of the Collateral Ligaments after Posterior Stabilized vs. Cruciate Retaining Total Knee Arthroplasty, WCB 2018, Dublin, Ireland.
- Uncertainty Quantification in Joint Reaction Force Analysis during a Simulated Squat Activity, CMBBE 2018, Lisbon, Portugal.
- Effects of Joint Line Elevation on Strain Patterns of The Collateral Ligaments After Total Knee Arthroplasty, ESB 2017, Seville, Spain.

## Other Activities

- Adhoc reviewer for multiple journals including “*Journal of Clinical Medicine*” and “*The Knee*”
- OpenSim expert in the OpenSim Workshop 2020, Zürich, Switzerland
- Member of the P&K committee of the Institute for Biomechanics, ETH Zürich, Switzerland

## Active Memberships in Scientific Societies

- International Society of Biomechanics
- European Society of Biomechanics

## Students supervised

### PhD students (2 ongoing):

Ning Guo (**funded by Chinese Scholarship Council**), The Influence of Ligament Properties on Knee Laxity following Total Knee Replacement. ETH Zürich, ongoing.

Michael Dreyer, Numerical simulation of wear produced by prosthetic joint replacements. ETH Zürich, ongoing.

### MSc Students (more than 10):

Sabrina Hörmann (**funded by IDEA League**), The influence of intraoperative tensioning of the posterior cruciate ligament on the knee joint mechanics in cruciate retaining total knee arthroplasty. ETH Zürich, 2022.

Amira Hamani, Sensitivity of musculoskeletal modelling outcomes to variation in the knee prosthesis alignment parameters. ETH Zürich, 2021.

Barbara Szazi, Finite element analysis of the performance of three different knee implant systems during activities of daily living, ETH Zürich, 2021.

Sambhav Jain (**funded by Swiss national Hand Surgery Society**), Finite element analysis of the scaphoid fracture healing, ETH Zürich, 2020-2021.

Caroline Bachem, Investigation of the influence of wearing weight-lifting shoes on the squat performance, ETH Zürich, 2018.

## Language and software skills

**Languages:** Persian (native), English (advanced), German (TELC B1)

**Software:** OpenSim, VICON Nexus, ANSYS, 3D Slicer, Siemens NX, MITK, MATLAB, SPSS

## References

Prof. Dr. William R. Taylor

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