

Horea T. Ilies

Professor and Director – School of Mechanical, Aerospace, and Manufacturing Engineering
University of Connecticut

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University Leadership Positions

- Director, School of Mechanical, Aerospace, and Manufacturing Engineering
- Director, DREAM Research Center @UConn - a \$5M/year research center established in 2022 together with the US Army/Ground Vehicles Systems Center
- Chair of the SoE Strategic Planning Committee, 2022

Key Leadership Contributions at UConn

- initiated and led the set up of the \$5M/year DREAM Research Center @UConn
- developed proposal to transition the ME department to a School of Mechanical and Aerospace Engineering
- hired 16 outstanding new faculty with 7 NSF CAREER awardees since 2017
- stimulated a 370% increase in departmental active research grants from \$12.7M (2017) to \$47M (2023) and a 260% increase in research expenditures (2017-2023)
- managed a 26% and 27% increase in undergrad and grad student populations
- oversaw a 63% and 30% increase in the number of minority and female students in ME, respectively, (2021 vs 2017)
- increased the number of female ME faculty by 66%; mentored and promoted underrepresented and minority faculty for leadership positions
- oversaw the launch of new graduate programs, new undergraduate and graduate curricula; planned a new BS degree in Aerospace Engineering
- organized the Northeast ME Chairs Summit during the summer of 2023 @ UConn and showcased the department, school and UConn
- developed, proposed, and implemented new overarching departmental policies, including faculty mentoring, SET+, travel support for faculty development

Professional Leadership Positions

- General Program Chair for ASME-IDETC 2008
- General Conference Chair for 2013 ASME Design Automation Conference
- General Conference Chair for 2015 SIAM/ACM Solid and Physical Modeling
- Chair of the ASME Executive Design Automation Committee
- Member of the Editorial Board for 3 journals and of the Advisory Board for US Military Academy, and Automotive Research Center @ University of Michigan

Research Highlights

- \$16.1M in research funding, mostly as PI or sole PI (30% NSF; 60% DoD; 10% Industry and Dept. of Ed.)
- NSF CAREER '07; 3 Best Paper awards; *continuously* funded by NSF since '05
- current PI of 5 active grants: 2 NSF (sole-PI), 2 DoD, 1 DARPA, 1 Dept. of Ed.
- 56 journal papers and book chapters; 40 refereed conference papers; 8 patents/invention disclosures; 22 invited talks
- 4-year industry R&D experience at Ford Motor Company (2000-2004)
- Member of the Connecticut Academy of Science and Engineering (CASE); multiple best-paper awards

Formal Education	<p>Ph.D. in Mechanical Engineering, University of Wisconsin, Madison, 1995 - 2000. Thesis title “<i>On Shaping Moving Mechanical Parts</i>”, advisor Prof. Vadim Shapiro.</p> <p>M.S. in Mechanics, Department of Material Science and Mechanics, Michigan State University, East Lansing, Michigan. GPA 4.0/4.0, 1993 - 1995.</p> <p>M.S./B.S. in Mechanical Engineering, Technical University of Cluj, Romania. GPA 9.30/10, with 10/10 for the final thesis; graduated in top 2 % of the class (approx. 200 students), 1988 - 1993.</p>
Appointments	<p>Department Head, January 2017- present, Department of Mechanical Engineering, University of Connecticut. Starting with November 1, 2023, I will serve as the director of the new School of Mechanical, Aerospace, and Manufacturing Engineering.</p> <p>Professor, August 2016 - present, Department of Mechanical Engineering with dual appointment in Computer Science and Engineering, University of Connecticut.</p> <p>Castleman Term Professor in Engineering Innovation, 2012 - 2016, University of Connecticut.</p> <p>Associate Professor, 2010 - August 2016, Department of Mechanical Engineering, and University of Connecticut.</p> <p>Associate Professor, 2010 - 2016, Department of Computer Science and Engineering, University of Connecticut.</p> <p>Visiting Professor, May - August 2007, Faculty of Electrical Engineering, Mathematics and Computer Science, Delft Institute of Technology, Delft, The Netherlands.</p> <p>Assistant Professor, 2004 - 2010, Department of Mechanical Engineering, University of Connecticut.</p> <p>R&D Engineer, August 2000 - August 2004, <i>Ford Scientific Research Laboratories, Cross Attribute Optimization and Robust Engineering, Michigan Truck Plant, Product Development – Body Engineering</i>, Ford Motor Company.</p>
Research Goal	<p>Bridging engineering concepts, computational algorithms and mathematically provable formalisms to enable systematic and efficient design, analysis, and manufacturing of engineering artifacts. My research has a particular focus on foundational issues in computational design and geometric reasoning, and on the interaction between geometry and physics to develop new tools and paradigms for conceptual design as well as for creating and interacting with geometric information.</p>
Research Interests	<p>Geometric and Physical Modeling, Artificial Intelligence in Engineering Design, Analysis and Manufacturing, Kinematics and Robotics, Virtual Reality.</p>
Awards	<p>Member of the Connecticut Academy of Science and Engineering (CASE), elected in 2018.</p> <p>Best Paper Award, among 130 papers, Computers and Information in Engineering Conference, ASME IDETC/CIE 2015, Boston, MA.</p> <p>Best Paper Award, among 147 papers, Computers and Information in Engineering Conference, ASME IDETC/CIE 2014, Buffalo, NY.</p> <p>Second Best Paper Award, SIAM/ACM/SIGGRAPH Conference on Geometric and</p>

Physical Modeling, GDSPM 2015. Conference has historically had an acceptance rate between 20-30%.

Castleman Term Professor in Engineering Innovation, University of Connecticut 2012-2016.

National Science Foundation CAREER award, Engineering Design, 2007.

Teaching Excellence Award, Mechanical Engineering, University of Connecticut, 2009.

Ford Product Development Leadership Program, nomination, 2002, Ford Motor Company.

William F. Vilas Fellowship, 1997, University of Wisconsin, Madison.

Graduate Office Fellowship for academic achievements, spring 1994, Michigan State University.

European Community scholarship/grant, EU-TEMPUS program, 1993.

Republican Merit Scholarship Romanian state (1991 - 1993).

Professional Activities

External Review Board, Automotive Research Center, University of Michigan, 2021 – 2023.

Editorial Board, Journal of Computer-Aided Design (Elsevier) 2012 – present.

Editorial Board, Computer Aided Design and Applications, (Taylor and Francis) ISSN 1686-4360, 2010 – present.

Advisory Board Member, C&ME, United States Military Academy at West Point, 2021 – present.

General Co-chair, 2015 SIAM/ACM Symposium on Geometric and Physical Modeling.

Executive Committee, ASME/IDETC Design Automation Conference, 2010 – 2015.

Conference Chair, 2013 ASME/IDETC Design Automation Conference.

Program Committee, 2009-present SIAM/ACM Geometric and Physical Modeling, SIAM-GD, 7th International Conference on Research Into Design (ICoRD'19), 2009-present ICED -International Conference on Engineering Design, IMProVe 2011, ICED21, Design 2012-present, 2004-present ASME IDETC Design Automation Conference.

General Program Co-Chair, 2008 ASME International Design Engineering and Technical Conferences & Computer and Information in Engineering Conference, New York, NY.

Scientific Advisory Board, Journal of Endodontics, American Association of Endodontists.

Bézier Award Jury, the Solid Modeling Association.

Invited reviewer for the European Research Council (ERC), 2017, Romanian Na-

tional University Research Council (NURC), 2008, Croatian Science Foundation, 2016.

Invited Associate Editor, ASME Journal of Medical Devices, Fall 2006.

Paper review coordinator 2002 – present ASME Design Engr. Technical Conferences.

Paper reviewer for Computer Aided Design; The Visual Computer; ASME Transactions - Journal of Mechanical Design; ASME Transactions - Journal of Medical Devices; ASME Transactions - Journal of Computing and Information Science in Engineering; Journal of Engineering Design (Taylor & Francis), ACM Symposium on Solid Modeling and Applications; International Journal of Computer Integrated Manufacturing; ASME Design Engineering and Technical Conferences; International Conference on Shape Modeling and Applications; International Symposium on Tools and Methods of Competitive Engineering, 2004-2008; ASME Turbo Expo 2006, ASME 2010 World Conference on Innovative Virtual Reality (WINVR2010); IEEE World Haptics 2019.

Panel committee member, *National Science Foundation*, 2002 – present: several programs within NSF-CMMI; 2009: NSF-CNS.

Member ASME, SIAM.

**Invited
Professional
Presentations**

École Polytechnique Fédérale De Lausanne (EPFL), invited presentation, November 2018.

NSF Cybermanufacturing workshop on Enabling Composable & Modular Manufacturing through Abstractions, International Computer Science Institute, Berkeley, CA, June 2016.

Defense Science Office, DARPA, Arlington, VA, November 9, 2014.

IDETC & CIE 2014, invited presentation, Emerging Systems and Applications, Conference on Mechanical Vibration and Noise.

Industrial Tutorial, Ninth International Symposium on Tools and Methods of Competitive Engineering, TMCE 2012, Karlsruhe, Germany, May 2012.

Rensselaer Polytechnic Institute, March 2012.

Pratt and Whitney, June 2011.

University of Rhode Island, Mechanical Engineering, February 2011.

KAU University, November 2009.

Iowa State University, Virtual Reality and Applications Center (VRAC), May 2010.

University of Maryland Baltimore County, Mechanical Engineering, October 2008.

Stony Brook University, Mechanical Engineering, April 2008.

TU Delft, Faculty of Biomedical Engineering, July 2007.

TU Delft, Faculty of Industrial Design Engineering, July 2007.

TU Delft, Computer Graphics and CAD/CAM group, June 2007.

IBM Thomas J. Watson Research Center, Modeling and Integration Technologies,

February 2006.

Pratt and Whitney, Core Structures Group, November 2005.

Boeing - Phantom Works, Mathematical and Computer Technologies Group, October 2005.

Pratt and Whitney, Systems and Optimization Group, August 2005.

National Institute of Standards and Technology, October 2004.

University of Connecticut, October 2004.

Ford Motor Company, Structures Group, Fall 2003.

Ford Motor Company, Scientific Research Labs, Spring 2002.

Major Grants **Total amount of competitive grants received since 2005: about \$16.1M (mostly as PI or sole PI).**

Sole-PI: *A Universal Framework for Geometric Information in Product Development*, **NSF**, \$500k, 2023-2026.

PI: *DREAM Research Center: Digital Design REsearch, Analysis and Manufacturing*, **Army GVSC**, \$5,000,000, 2024 - 2026.

Sole-PI: *SPI2 Packaging Optimization*, **DARPA**, \$101k, Feb. 23 – Dec, 2023.

Co-PI: *Pilot Investigation of Topology Optimization for Navy Underwater Systems*, **NIUVT/ONR**, \$200k, 2023-2024.

Sole-PI: *EAGER: FINDFabs: Searching The Universe of Manufactured Parts Through Proxy Geometric Representations*, **NSF**, \$300k, 2022 - 2024.

PI: *DREAM Research Center: Digital Design REsearch, Analysis and Manufacturing*, **Army GVSC**, \$4,000,000, 2023 - 2025.

Sole PI: *CAD Defeaturing Tool Development for Navy Virtual Prototyping Applications*, **NIUVT/ONR**, \$217,500, 2022 - 2023.

PI: *EnCoDiT: Engineering Cognitive Digital Twin Technologies For Predictive Design And Manufacturing*, **GAANN - Dept. of Ed.**, 2021-2026, \$986,596.

PI: *Systematic Design, Analysis and Control of Manufacturable Nano Machines*, **NSF – CMMI**, August 2016 - August 2022, award # 1635103, \$350,000.

Sole PI: *Theoretical Foundations and Algorithms for Geometric Interfaceability In Virtual Product Development*, **NSF – CMMI**, August 2015 - August 2021, award # 1462759, \$440,000.

Sole PI: *CHS: Small: Interactive Haptic Assembly and Docking for 3D Shapes*, **NSF - CISE**, August 2015 - August 2021, award # 1526249, \$497,499.

Sole PI: *Medial Zones: Formulation and Engineering Applications*, **NSF - CMMI**, Engineering Design and Innovation Program, 9/1/2012 – 8/31/2016, \$375,000, award # 1200089.

PI: *MRI: Development of a Gesture Based Virtual Reality System for Research in Virtual Worlds*, **NSF - CISE**, Computer and Network Systems Program, 7/15/2009 –

7/14/2016, \$1,117,198 (NSF share \$782,039), award # 0923158.

Co-PI (5%): *GOALI supplement (with IBM) to MRI: Development of a Gesture Based Virtual Reality System for Research in Virtual Worlds*, **NSF - CISE**, Computer and Network Systems Program, 8/15/2010 – 8/14/2013, \$149,000.

Sole PI: *Geometric Skeletons for Topologically Evolving Domains*, **NSF - CMMI**, Engineering Design and Innovation Program, 8/1/2009 – 7/31/2013 (with no cost-extension), \$319,933, award # 0927105.

Co-PI (50%): *A Mechanics Framework for the Analysis and Design of Protein Based Nano Machines*, **NSF - CMMI**, Engineering Design and Innovation Program, \$325,100, 8/1/2009 – 7/31/2013, award # 0856401.

Co-PI (5%): *EAGER: Visualization of Protein Folding for Nano-Machine Design*, **NSF - CMMI**, Engineering Design and Innovation Program, 8/15/2010 – 8/14/2011, \$49,896, award # 1053077.

Sole-PI: *Assessment of UGS Digital Manufacturing Solutions*, Connecticut Center for Advanced Technology - **CCAT**, \$100,528, July 2008-June 2009.

Co-PI (50%): *SGER: A Mechanics Framework for the Analysis and Design of Protein Based Nano Machines*, **NSF - CMMI**, Engineering Design, \$99,958 (\$49,979), award #0733107.

Sole PI: *CAREER: Geometric Singularities in Engineering Design and Manufacturing: a Generic Spacetime Approach*, **NSF CAREER - CMMI**, Engineering Design Program, 8/1/2007 – 7/31/2012, \$400,000, award #0644769.

Sole PI: *COGEM: Constrained Geometric Morphing of Product Families of Mechanical Designs*, **NSF**, 3/1/06 – 2/28/10, \$320,000, award #0555937.

Sole PI: *NSF IREE: Applications of Constrained Geometric Morphing to Feature based Engineering Design - a European Collaboration with Delft University of Technology*, **NSF**, \$50,300, 1/1/07 – 12/31/07.

Sole PI: *Shape Deformation with Implicit Functions*, **University of Connecticut Research Foundation**, \$20,000, 1/1/05 – 08/31/06.

**Current
Research
Group**

Rakesh Balamurugan, PhD degree, ME, Aug 2023 – present.

Mohammad Behzadi, PhD degree, ME, August 2018 - present.

Amir Vahedi, PhD degree, ME, Aug 2023 – present.

Kyle Vu, MS degree, 2022 - present.

Peter Zaffetti, PhD degree, Computer Science, September 2021 - present.

Bei Zhou, PhD degree, ME, August 2017 - present.

**Graduated
Students**

Meysam Chorsi, PhD degree, March 2017 - 2023; postdoc at Stanford University.

Jiangce Chen, PhD degree, August 2017 - Dec 2022; now a postdoc at Carnegie Mellon University

Martin Huber, PhD degree, co-advisor with Prof. K. Kazerounian, 2021; now an

Assistant Professor in-Residence at UConn.

Caytlin Mundrane, MS degree, co-advisor with Prof. K. Kazerounian, 2021; now Data Analyst at GXO Logistics

Matthew Eschbach, MS degree, co-advisor with Prof. K. Kazerounian, 2020; Principal Engineer at Medtronic

Radu Corcodel, PhD degree, January 2011 - 2019; Principal Research Scientist, Mitsubishi Electric Research Laboratories.

Arun Malla, MS degree, co-advisor with Prof. K. Kazerounian, August 2017 - 2019, PhD student at Virginia Tech.

Samuel Soifer, MS degree, August 2017 - 2019; Test Engineer at Pratt & Whitney.

Morad Behandish, PhD, December 2016; manager of the Computational Design group at XEROX PARC (now Palo Alto Research Center).

Weling Li, MS degree, December 2017.

Frol Periverzov, PhD degree, August 2016; Product Architect, Unicordia.

Reed Williams, PhD degree, advisor, May 2017; Research Scientist, Siemens.

Pouya Tavousi, PhD, co-major advisor with Prof. K. Kazerounian, May 2016; Senior research Scientist, UConn.

Xiaojun Zhao, MS degree, August 2015, Data Scientist at Snowflake.

Ata Eftekharian, PhD, August 2011. Postdoc at UT Austin.

Zahra Shahbazi, PhD, August 2011. Associate Professor at Manhattan College, NY.

Nier Wu, PhD, December 2011.

Hüseyin Erdim, PhD degree, advisor, August 2005-June 2009. Senior Engineer in Systems, Cruise.

Mikhail (Kail) Frank, MS degree, Fall 2007-June 2009; Smart Bending Unit Manager, Bystronic, Switzerland.

Jesse Parker, MS degree, major advisor, Summer 2007; Senior Test Engineer, SRAM LLC, Germany.

Peter Bohnenkamp, MS degree, co-major-advisor with Prof. K. Kazerounian, Summer 2007.

**External
Committee**

Ryan Pavlik, PhD degree, Iowa State University.

**Graduate
Thesis
Committee**

Raghavendran Subramanian, MS degree, June 2005. **David Giblin**, PhD degree. **Karla Maria Rios**, MS degree, May 2006. **Ying Liu**, MS degree, May 2006. **Xinjie Fang**, PhD, June 2007. **Christopher Madden**, June 2007. **Mike Elmoznino**, MS, March 2007. **Paul McCullough**, MS, June 2009. **Loc Duong**, PhD, May 2010. **Mark Bacon**, MS, December 2010. **Hami Golbayani**, PhD, May 2012. **Shuihua Wu**, PhD, May 2013. **Rudy Cepeda-Gomez**, PhD, May 2012 **Qiwen Gan**, PhD, May 2014. **Jiang Wang**, PhD, May 2014. **Qingbin Gao**, PhD, May-2015. **He Li**, PhD, May 2014. **Kai Zhou**, PhD, December 2015. **Soud Choudhury**, PhD, Decem-

ber 2015. **Jeffrey Roberge**, MS, 2016. **Vi Quoc Ha**, PhD, December 2017. **David Yoo**, PhD, 2017. **Alex Cocco**, PhD, 2018. **Jeffrey Roberge**, MS, 2018. **Pauline Menoret**, MS, 2018. **Peter Joseph Damian**, MS, 2018. **Yuan Yuan**, PhD, 2018. **Pei Cau**, PhD, 2018. **Shilong Li**, PhD, 2018. **Manal Tahan**, MS, 2019. **Shanglong Zhang**, PhD, 2019. **Hesaneh Kazemi**, PhD, 2020. **Christian Schirmer**, MS 2022. **Hollis Smith**, PhD, 2022. **Jeremy Brine**, MS 2023. **Magdalena Wegrzyniak**, MS, 2023. **David Cohen**, PhD, 2022.

Undergraduate Students

Winson Ye, now PhD student at College of William and Mary. **William Pratt**, Pratt & Whitney. **Todd Koplín**, 2012 - 2013. **William Snider**, 2012 - 2013.

Patents and Invention Disclosures

Electrowetting For Drop-On-Demand Metal Additive Manufacturing, Patent Application, with J. Chen, June 2023.

Highly Piezoelectric Biodegradable Flexible Nanofibers, provisional patent application, with. T.D. Nguyen, M. T. Chorsi, Tra Vinikoor, K. Kazerounian, February 2022.

Method for computing the maximum build volume of Additively Manufactured components using arbitrary shape print nozzles and n -DOF machines, OVPR invention disclosure, with R. Corcodel, June 2017.

Method for systematic design of one-degree-of-freedom mobile molecular linkages with closed kinematic loops from a finite set of molecular building blocks, OVPR invention disclosure, with P. Tavousi and K. Kazerounian, April 2016.

Knee Orthosis Device and Associated Methods, provisional patent submitted, CSTC – UCONN, July 2013, with K. Kazerounian, M. Huber, and M. Eschbach.

Geometric Singularity Detection, United States Patent no. 8,849,617, September 2014.

Handheld switch measurement system, United States Patent no. 7,141,963, November 2006, with J. Rankin, P. Stewart, P. Buttolo, and A. Marsan.

Methods and Apparata for Shaping Moving Geometric Shapes, United States Patent no. 6,044,306, March 2000, with V. Shapiro.

Book Chapters

Chorsi, M.T., Le, T.T., Das, R., Vinikoor, T., Chorsi, H.T., Kazerounian, K., Ilies, H. and Nguyen, T.D., 2023. **Materials for Biocompatible Piezoelectric Devices**, Reference Module in Materials Science and Materials Engineering, Elsevier, 2023.

C. Mundrane, M.T. Chorsi, H. Ilies, K. Kazerounian, **Exploring Electric Field Perturbations as the Actuator for Nanorobots and Nanomachines**, Advances in Robot Kinematics 2022. ARK 2022. eds. Oscar Altuzarra, Andrés Kecskeméthy, Springer Proceedings in Advanced Robotics, 2022.

M. T. Chorsi, P. Tavousi, C. Mundrane, V. Gorbatyuk, K. Kazerounian, H. Ilies, **One Degree of Freedom 7-R Closed Loop Linkage as a Building Block of Nanorobots**, Advances in Robot Kinematics, Lenarčič J., Siciliano B. (eds) Advances in Robot Kinematics 2020. ARK 2020. Springer Proceedings in Advanced Robotics, vol 15, 2021.

M. Huber, M. Eschbach, H. Ilies, K. Kazerounian, **Novel Quasi-Passive Knee Orthosis with Hybrid Joint Mechanism**, Interdisciplinary Applications of Kinemat-

ics, 2015, ISBN 978-3-319-10722-6

H.P. Cassidy, T.J. Peters, H. Ilies, and K.E. Jordan, **Topological Integrity for Dynamic Spline Models During Visualization of Big Data**, Topological Methods in Data Analysis and Visualization III: Theory, Algorithms, and Applications, eds. Bremer, P.-T., Hotz, I., Pascucci, V., Peikert, R., Springer 2014, ISBN 978-3-319-04098-1.

K. Kazerounian, H. Ilies, **Protein Molecules: Evolution's Design for Kinematic Machines**, 21st Century Kinematics, ed. J.M. McCarthy, Springer, ISBN 978-1-4471-4509-7, pp 217–244, 2013.

C. Madden, P. Bohnenkamp, K. Kazerounian and H. Ilies, **Predicting Protein Conformational Transitions by Trajectory Planning Through Torsion Angle Propensity Maps**. Interdisciplinary Applications of Kinematics, A. Kecskeméthy, V. Potkonjak and A. Müller (eds), Springer, ISBN 978-94-007-2978-0, pp 135–149, 2011.

Z. Shahbazi, T.A.P.F. Pimentel, H.T. Ilies, K. Kazerounian, P. Burkhard, **A Kinematic Observation and Conjecture for Stable Construct of a Peptide Nanoparticle**, Advances in Robot Kinematics, Motion in Man and Machine, J. Lenarčič, M. M. Stanišić (eds), Springer, ISBN 978-90-481-9261-8, pp 203–210, 2010.

Journal Publications

M.T. Chorsi, T.T. Le, F. Lin, T. Vinikoor, R. Das, J.F. Stevens, C. Mundrane, J. Park, K.T.M. Tran, Y. Liu, J. Pfund, R. Thompson, W. He, M. Jain, M.D. Morales-Acosta, O.R. Bilal, K. Kazerounian, H. Ilies, T.D. Nguyen, **Highly piezoelectric, biodegradable and flexible amino acid nanofibers for medical applications**, Science Advances, vol. 9, no. 24, 2023.

M.M. Behzadi, H. Ilies, **Taming Connectedness in Machine-Learning-based Topology Optimization with Connectivity Graphs**, to appear in CAD, 2023.

M.T. Chorsi, W. Linthicum, A. Pozhidaeva, C. Mundrane, V. K. Mulligan, P. Tavousi, V. Gorbatyuk, O. Vinogradova, J. Hoch, B.D. Huey, T.D. Nguyen, K. Kazerounian, H. Ilies, **Controllable Assemblies of Biomolecular Machines Engineered from Single Macrocyclic Peptides**, in review, 2023.

M. Madani, M.M. Behzadi, D. Song, H. Ilies, A. Tarakanova. **Improved Inter-Residue Contact Prediction Guides Construction of Protein-based Materials**, Computational and Structural Biotechnology, vol. 20, 2022.

S. Peddada, L. Zeidner, H. Ilies, K.A. James, J.T. Allison, **Towards a Holistic Design of Spatial Packaging of Interconnected Systems with Physical Interactions (SPI2)**, ASME Journal of Mechanical Design, 2022.

J. Chen, H. Ilies, and C. Ding, **Graph-Based Shape Analysis for Heterogeneous Geometric Datasets: Similarity, Retrieval and Substructure Matching**, Computer-Aided Design, vol 143, 2022.

M.M. Behzadi, H. Ilies, **GANTL: Towards Practical and Real-Time Topology Optimization with Conditional GANs and Transfer Learning**, Journal of Mechanical Design 144, no. 2 2022.

M.M. Behzadi, H. Ilies, **Real-Time Topology Optimization in 3D via Deep Transfer Learning**, Computer-Aided Design, Volume 135, June 2021.

M.T. Chorsi, P. Tavousi, C. Mundrane, V. Gorbatyuk, K. Kazerounian, H. Ilies, **Kinematic Design of Functional Nanoscale Mechanisms from Molecular Primi-**

- tives, ASME Journal of Micro- and Nano-Manufacturing, 9(2), 021005, 2021.
- M. Huber, M. Eschbach, H. Ilies, K. Kazerounian, **Functional Evaluation of a Personalized Orthosis for Knee Osteoarthritis in a Motion Capture Analysis**, Journal of Medical Devices, 15(4), 2021.
- J. Chen and H. Ilies, **Maximal Disjoint Ball Decompositions for Shape Modeling and Analysis**, Computer-Aided Design, No 126, special issue on ACM/SIGGRAPH Symposium on Solid and Physical Modeling, 2020.
- R. Williams and H Ilies, **Practical Shape Analysis and Segmentation Methods for Point Cloud Models**, Computer Aided Geometric Design, Vol. 67, pp 97-120, 2018, <https://doi.org/10.1016/j.cagd.2018.10.003>. Special issue on “*Heat Diffusion Equation and Optimal Transport in Geometry Processing and Computer Graphics.*”
- M. T. Chorsi, E. J. Curry, H. T. Chorsi, R. Das, J. Baroody, P. K. Purohit, H. Ilies, T. D. Nguyen, **Piezoelectric Biomaterials for Sensors and Actuators**, Adv. Mater. 2018, 1802084. <https://doi.org/10.1002/adma.201802084>.
- E. Curry, K. Ke, M. Chorsi, K. Wrobel, A.N. Miller III, A. Patel, I. Kim, J. Feng, L Yue, K. Lo, C. Laurencin, H. Ilies, P. Purohit, T.D. Nguyen, **A Biodegradable Piezoelectric Force Sensor**, PNAS, January 16, 2018, <https://doi.org/10.1073/pnas.1710874115>.
- R. Corcodel and H. Ilies, **Printability Analysis in Additive Manufacturing**, Computer Aided Design and Applications, no. 15, vol. 3, pp. 318–329, 2018.
- R. Williams and H. Ilies, **Adaptive Eigensystem Truncation for Spectral Shape Signatures**, Computer Aided Design and Applications, Taylor & Francis, vol. 14, no. 6, 2017.
- M. Behandish and H. Ilies, **Haptic Assembly and Prototyping: A Survey**. Technical report, November 2016. <https://arxiv.org/abs/1712.00750>.
- X. Zhao and H Ilies, **Learned 3D Shape Descriptors for Classifying 3D Point Cloud Models**, CAD and Applications, Taylor & Francis, Volume 14, No 4, 2017.
- P. Tavousi, M. Behandish, H. Ilies, and K. Kazerounian, **Protifold II: Enhanced Model and Implementation for Kinetostatic Protein Folding**, ASME Transactions, Journal of Nanotechnology in Engineering and Medicine, no. 6, 034601, 2016.
- P. Tavousi, K. Kazerounian, and H. Ilies, **(Featured Article - ASME JMD) Synthesizing Functional Mechanisms From a Link Soup**, ASME Transactions, Journal of Mechanical Design, no. 138, 062303, 2016.
- M. Behandish and H. Ilies, **(2015 CIE Best Paper Award) Haptic Assembly Using Skeletal Densities and Fourier Transforms**, ASME Transactions, Journal of Computer and Information Science in Engineering, 16(2):021002-021002-11, 2016.
- M. Behandish and H. Ilies **(Second Best Paper Award SIAM GDSPM 2015) Analytic Methods for Geometric Modeling via Nonuniform Spherical Sampling**, Computer Aided Design, Elsevier, special issue 2015 SIAM/ACM Conference on Geometric and Physical Modeling, <http://dx.doi.org/10.1016/j.cad.2015.06.016>, 2015.
- M. Behandish and H. Ilies, **(2014 CIE Best Paper Award) Peg-in-Hole Revisited: A Generic Force Model for Haptic Assembly**, ASME Transactions, Journal of Computer and Information Science in Engineering, 15(4):041004-041004-11,

2015.

H. Ilies, M. Parkinson, C. C. Seepersad, M. Kokkolaras, K. Ragsdell, P. Papalambros, F. Mistree, C. Williams, R. Rai, J. Panchal, S. Ferguson, B. DuPont, J. T Allison, **New Perspectives on Design Automation: Celebrating the 40th Anniversary of the ASME Design Automation Conference**, ASME Journal of Mechanical Design, 137(5), p. 050301, May 2015.

D. Flanagan, H. Ilies, B. O'Brien, A. McManus, B. Larrow, **Jaw Bite Force Measurement Device**, Journal of Oral Implantology, 38(4):361-4, August 2012, PubMed PMID: 20822470.

A. Eftekharian and H. Ilies, **Medial Zones: Formulation and Applications**, Computer Aided Design, 44(5), May 2012, pp 413–423.

F. Periverzov and H. Ilies, **3D Imaging for Hand Gesture Recognition: Exploring The Software-Hardware Interaction of Current Technologies**, *invited paper*, 3D Research, vol. 3, no. 3, September 2012, pp 1–15.

A. Eftekharian and H. Ilies, **A Family of Skeletons for Motion Planning and Geometric Reasoning Applications**, AI EDAM special issue on Representing and Reasoning about 3D Space, AI EDAM, volume 25, issue 4, 2011, pp. 375-392.

N. Wu and H. Ilies, **Shaping with Deformations**, Computer Aided Design and Applications, vol. 8, no. 2, 2011, pp 249-268.

A. Eftekharian and H. Ilies, **Curve Skeletons of Planar Domains**, Computer-Aided Design and Applications, vol. 8, no. 1, January 2011, pp 87-97.

M. Frank and H. Ilies, **Fast Hierarchical Discretization of Parametric Boundary Representations**, International Journal of Shape Modeling, Vol. 16, Nos. 1 & 2, 2010, pp 57–79.

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Z. Shahbazi, H. Ilies, and K Kazerounian, **Hydrogen Bonds and Kinematic Mobility of Protein Molecules**, ASME Transactions, Journal of Mechanisms and Robotics, vol. 2, no. 2, May 2010.

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