

Horea T. Ilies

Departments of Mechanical Engineering and Computer Science and Engineering, University of Connecticut
Ph: (860) 486-8813, Fax (860) 486-5088, *ilies@enr.uconn.edu*, <http://cdl.engr.uconn.edu>

Formal Education

Ph.D. in Mechanical Engineering, University of Wisconsin, Madison, 1995 - 2000.
Thesis title “*On Shaping Moving Mechanical Parts*”, advisor Prof. Vadim Shapiro.

M.S. in Mechanics, Department of Material Science and Mechanics, Michigan State University, East Lansing, Michigan. GPA 4.0/4.0, 1993 - 1995.

Advanced Course in Tribology, University of Cambridge, England, March 1993.

Exchange Student under the TEMPUS program of the European Community, University of Central Lancashire, Preston, England, March - June 1993.

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.

Positions

Professor, August 2016 - present, Department of Mechanical Engineering with dual appointment in the Computer Science and Engineering, University of Connecticut.

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

Associate Professor, 2010 - August 2016, Department of Mechanical Engineering, and University of Connecticut.

Associate Professor, 2010 - 2016, Department of Computer Science and Engineering, University of Connecticut.

Visiting Professor, May - August 2007, Faculty of Electrical Engineering, Mathematics and Computer Science, Delft Institute of Technology, Delft, The Netherlands.

Assistant Professor, 2004 - 2010, Department of Mechanical Engineering, University of Connecticut.

R& D Engineer, August 2000 - August 2004, *Ford Scientific Research Laboratories, Cross Attribute Optimization and Robust Engineering, Michigan Truck Plant, Product Development – Body Engineering*, Ford Motor Company.

Research Assistant, September 1995 to June 2000, *Department of Mechanical Engineering*, University of Wisconsin – Madison.

Skills Development Specialist, January 1996 to May 1998, *Division of Intercollegiate Athletics*, University of Wisconsin – Madison.

Research Assistant, April 1994 - June 1995, *Department of Materials Science and Mechanics*, Michigan State University.

Teaching Assistant, 1994 - 1995, *Department of Materials Science and Mechanics*, Michigan State University.

Science Tutor, 1994 - 1995, *Athletic Department*, Michigan State University.

Research Engineer, July-September 1993, *I.C.P.I.A.F.*, Cluj-Napoca, Romania.

Awards

Second Best Paper Award, SIAM/ACM/SIGGRAPH Conference on Geometric and Physical Modeling, GDSPM 2015. Conference has always had an acceptance rate between 20-30%.

Best Paper Award, among 130 papers, Computers and Information in Engineering Conference, ASME IDETC/CIE 2015, Boston, MA.

Best Paper Award, among 147 papers, Computers and Information in Engineering Conference, ASME IDETC/CIE 2014, Buffalo, NY.

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

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

National Science Foundation CAREER award, Engr. Design Program, 2007.

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

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.

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, 2009-2016 SIAM/ACM Geometric and Physical Modeling, 2009-2016 ICED -International Conference on Engineering Design, IMProVe 2011, 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 En-

dodontists.

Invited reviewer for Romanian National University Research Council (NURC), 2008.

Invited reviewer for 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).

Panel committee member, *National Science Foundation*, 2002-present – NSF-CMMI, 2009 NSF-CNS.

Member ASME, SIAM.

**Invited
Professional
Presentations**

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 \$4.6M (mostly as PI).**

PI: *Systematic Design, Analysis and Control of Manufacturable Nano Machines*, **NSF – CMMI**, August 2016 - August 2019, award # 1635103, \$350,000.

Sole PI: *Theoretical Foundations and Algorithms for Geometric Interfaceability In Virtual Product Development*, **NSF – CMMI**, August 2015 - August 2018, award # 1462759, \$440,000.

Sole PI: *CHS: Small: Interactive Haptic Assembly and Docking for 3D Shapes*, **NSF - CISE**, August 2015 - August 2018, 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.

Patents and Invention Disclosures

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

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

- R. Williams and H. Ilies, **Adaptive Eigensystem Truncation for Spectral Shape Signatures**, to appear in *Computer Aided Design and Applications*, Taylor & Francis, 2016.
- X. Zhao and H. Ilies, **Learned 3D Shape Descriptors for Classifying 3D Point Cloud Models**, to appear in *Computer Aided Design and Applications*, Taylor & Francis, 2016.
- P. Tavousi, M. Behandish, H. Ilies, and K. Kazerounian, **Protofold 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, **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 Bound-**

ary Representations, International Journal of Shape Modeling, Vol. 16, Nos. 1 & 2, 2010, pp 57-79.

H. Erdim and H. Ilies, **A Comparison of Sampling Strategies for Computing General Sweeps**, Computer Aided Design, Vol. 42, No. 8, pp 657–669, August 2010.

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.

A. Eftekharian and H. Ilies, **Distance Functions and Skeletal Representations of Rigid and Non-Rigid Planar Shapes**, Computer-Aided Design, vol. 41, no. 12, Dec 2009, pp 865–876.

H. Ilies, **Continuous Collision and Interference Detection for 3D Geometric Models**, ASME Transactions - Journal of Computer and Information Science in Engineering, vol. 9, no. 2, 2009, pp 021007-1–021007-7.

H. Erdim and H. Ilies, **Classifying Points for Sweeping Solids**, Computer Aided Design, vol. 40, no. 9, Sept. 2008, pp 987–998.

D. Flanagan, H. Ilies, B. Lasko and J. Stack, **Force and Movement of Non-Osseointegrated Implants: An In Vitro Study**, Journal of Oral Implantology, Vol. 35, No. 6, December 2009, pp. 270–276, PubMed PMID: 20017642

C. Madden, P. Bohnenkamp, K. Kazerounian and H. Ilies, **Residue Level 3D Workspace Maps for Conformational Trajectory Planning of Proteins**. International Journal of Robotics Research, vol. 28, no. 4, Apr. 2009, pp 450–463.

H. Ilies, D. Flanagan, P. McCullough, S. McQuoid, **Determining the Fatigue Life of Dental Implants**, ASME Transactions, Journal of Medical Devices, vol. 2, no 1, Mar. 2008.

D. Flanagan, H. Ilies, P. McCullough, S. McQuoid, **Measurement of the Fatigue Life of Mini Dental Implants: A Pilot Study**, Journal of Implantology, vol. 34, no 1, pp 7-11, Feb. 2008, pp. 011003-1:011003-7, PubMed PMID: 18616073.

H. Ilies, D. Flanagan, M. Raby, R. Stevenson, **Measuring Luxation in Dental Implants**, ASME Transactions, Journal of Medical Devices, vol. 2, no 1, Mar. 2008, pp 014501-1:014501-4.

H. Erdim and H. Ilies, **Detecting and Quantifying Envelope Singularities in the Plane**, Computer Aided Design, vol. 39, no. 10, Oct. 2007, pp 829-840.

D. Flanagan, H. Ilies, M. Raby, R. Stevenson, **Force Required to Luxate a Newly Placed Dental Implant in Bone: An In Vitro Pilot Study**, Journal of Oral Implantology, vol. 34, no. 3, pp 128–134, 2008, PubMed PMID: 18390237.

H. Ilies and V. Shapiro, **Equivalence Classes for Shape Synthesis of Moving Mechanical Parts**, ASME Transactions *Journal of Computing and Information Science in Engineering*, vol. 4, no. 1, pp 20-27, Mar. 2004.

H. Ilies and V. Shapiro, **A Class of Forms from Function: the Case of Moving Mechanical Parts**, *Research in Engineering Design*, vol. 13, no. 3, pp 157-166, 2002.

H. Ilies and V. Shapiro, **On Shaping with Motion**, ASME Transactions *Journal of*

Mechanical Design, vol. 122, no. 4, Dec. 2000, pp 567-574.

H. Ilies and V. Shapiro, **The Dual of Sweep**, *Computer Aided Design*, vol. 31, no. 3, Mar. 1999, pp 185–201.

M. Ostoja-Starzewski and H. Ilies, **The Cauchy and Characteristic Boundary Value Problems for Random Rigid Perfectly Plastic Media**, *International Journal of Solids and Structures*, vol. 33, no. 8, 1996.

**Refereed
Conference
Publications**

(rate of acceptance ~30%) M. Behandish and H. Ilies, **Analytic Methods for Geometric Modeling via Nonuniform Spherical Sampling**, 2015 SIAM/ACM Conference on Geometric and Physical Modeling.

(CIE Best Paper Award) M. Behandish and H. Ilies, **Haptic Assembly Using Skeletal Densities and Fourier Transforms**, IDETC - CIE, August 2015, Boston, MA.

P. Tavousi, K. Kazerounian, and H. Ilies, **Synthesis of Functional Mechanisms From a Link Soup**, IDETC - CIE, August 2015, Boston, MA.

(rate of acceptance ~32%) F. Periverzov and H. Ilies, **IDS: The Intent Driven Selection Method for Natural User Interfaces**, in IEEE 10th Symposium on 3D User Interfaces (3DUI), March 23-25, Arles, France, 2015.

M. Huber, M. Eschbach, H. Ilies, K. Kazerounian, **Customizable Joint Mechanism for Knee Orthosis**, IDETC - Mechanisms and Robotics, August 2014, Buffalo, NY.

(CIE Best Paper Award), M. Behandish and H. Ilies, **Peg-in-Hole Revisited: A Generic Force Model for Haptic Assembly**, IDETC - CIE, August 2014, Buffalo, NY.

M. Behandish, P. Tavousi, H. Ilies, and K. Kazerounian, **GPU-Accelerated Computation of Solvation-Free Energy For Kinetostatic Protein Folding Simulation**, IDETC - CIE, August 2013, Portland, OR.

P. Tavousi, M. Behandish, K. Kazerounian, and H. Ilies, **An Improved Free Energy Formulation and Algorithm for Kinetostatic Protein Folding Simulation**, IDETC - Mechanisms and Robotics, August 2013, Portland, OR.

H. P. Cassidy, T. J. Peters, H. Ilies, and K.E. Jordan, **Topological Integrity for Dynamic Spline Models During Visualization of Big Data**, TopoInVis - Topological Methods in Data Analysis and Visualization, March, 4-6, 2013, Davis, CA.

A. Eftekharian and H. Ilies, **Medial Zones in Motion Planning Applications**, poster, Workshop on Progress and Open Problems in Motion Planning, IEEE/RSJ International Conference on Intelligent Robots and Systems IROS 2011, San Francisco, CA.

A. Eftekharian and H. Ilies, **Shape and Topology Optimization with Medial Zones**, Proceedings of IDETC/Design Automation Conference, Washington DC, August 2011.

Z. Shahbazi, H. Ilies, K. Kazerounian, **Kinematic Motion Constraints of the Protein Molecule Chains**, Proceedings of IDETC/Mechanisms and Robotics, Washington DC, August 2011.

A. Eftekharian and H. Ilies, **Curve Skeletons of Planar Domains**, CAD Confer-

ence, Dubai UAE, June 2010.

M. Frank and H. Ilies, **Fast Hierarchical Discretization of Parametric Boundary Representations**, Proceedings of Tools and Methods for Competitive Engineering TMCE 2010, Ancona, Italy.

A. Eftekharian and H. Ilies, **Path Planning in Topologically Evolving Planar Environments**, IDETC/DAC 2009, San Diego, September 2009.

Z. Shahbazi, H. Ilies and K. Kazerounian, **Geometric Criteria for Formation of Hydrogen Bonds in Protein Molecules and their Application to Mobility Analysis**, IDETC/MR 2009, San Diego, September 2009.

H. Erdim and H. Ilies, **Computing Swept Volumes for Virtual Manufacturing Applications**, VIRMAN08 (2nd International Virtual Manufacturing Workshop), Torino, Italy, October 2008.

H. Erdim and H. Ilies, **Contact analysis between a moving object and its envelopes**, ASME IDETC 2008, Design Automation Conference, New York, August 2008.

K. Kazerounian and H. Ilies, **Kinematic Tools in Uncovering protein Conformation Pathways**, Proceedings of the Indo-US Workshop on Protein Kinematics & Protein Conformations, December 10-11, 2007, Indian Institute of Science, Bangalore.

H. Erdim and H. Ilies, **Octree-based Boundary Evaluation for General Sweeps**, International TMCE Symposium, April 2008.

H. Erdim and H. Ilies, **A Point Membership Classification Test for Sweeping Solids**, ASME IDETC 2007, Design Automation Conference, Las Vegas, September 2007.

N. Wu and H. Ilies, **Motion-Based Shape Morphing of Solid Models**, ASME IDETC 2007, Design Automation Conference, Las Vegas, September 2007.

H-J. Su, Jesse Parker, K. Kazerounian, H. Ilies, **A Comparison of Kinetostatic and Multibody Dynamics Models for Simulating Protein Structures**. ASME IDETC 2007, Mechanisms and Robotics Conference, Las Vegas, September 2007.

H. Ilies, D. Flanagan, M. Raby, R. Stevenson, **Measuring Luxation in Dental Implants**, 2007 Design of Medical Devices Conference, Minneapolis, April 17-19, 2007.

P. Bohnenkamp, K. Kazerounian, H. Ilies, **Structural Prediction of Peptide Based Nano-Systems via Progressive Landscape Evolution**, IFToMM 2007 - the 12th Congress in Mechanism and Machine Science, Besançon, France, June 2007.

H. Ilies, **Parametric Solid Modeling**, 32nd Design Automation Conference, 2006 IDETC, September 2006, Philadelphia, Pennsylvania.

H. Ilies, **On Detecting Undercutting in Conjugate Pairs**, 29th Mechanisms and Robotics Conference, IDETC2005, September 2005, Long Beach California.

H. Ilies and V. Shapiro, **On The Synthesis of Functionally Equivalent Mechanical Designs**, Computational Synthesis: From Basic Building Blocks to High Level Functionality, AAAI Symposium, March 2003.

H. Ilies and V. Shapiro, **A class of forms from function: the case of moving mechanical parts**, 2001 ASME Design Engineering Technical Conferences, 13th In-

ternational Conference on Design Theory and Methodology, Pittsburgh, PA.

H. Ilies and V. Shapiro, **On Shaping with Motion**, 1999 ASME Design Engineering Technical Conferences, Design Automation Conference, Las Vegas, NV.

H. Ilies and V. Shapiro, **UNSWEEP: Formulation and Computational Properties**, Proceedings of the 4th ACM Symposium on Solid Modeling and Applications, Atlanta, GA, May 1997.

H. Ilies and V. Shapiro, **An Approach to Systematic Part Design**, Proceedings of the 5th IFIP WG5.2 Workshop on Geometric Modeling in CAD, Warrenton, Virginia, May 9 - 23, 1996.

**Refereed
Extended
Abstracts**

R. Williams and H Ilies, **Adaptive Eigensystem Truncation for Spectral Shape Signatures**, CAD Conference, Vancouver, June 2016.

X. Zhao and H Ilies, **Learned 3D Shape Descriptors for Classifying 3D Point Cloud Models**, CAD Conference, Vancouver, June 2016.

R. Williams and H. Ilies, **Towards Multi-scale Heat Kernel Signatures for Point Cloud Models of Engineering Artifacts**, Workshop on Algebraic Topology and Machine Learning, NIPS, December 2012, Lake Tahoe, NV

A. Eftekharian and H. Ilies, **Medial Zones as Shape Parametrizations**, 2011 SIAM/ACM Joint Conference on Geometric and Physical Modeling, October 24-27, 2011.

Z. Shahbazi, H. Ilies, and K. Kazerounian, Protein Molecules as Natural Nano Bio Devices: Mobility Analysis, ASME Conf. Proc. 2010, 187 (2010), DOI:10.1115/NEMB2010-13021.

M. Frank and H. Ilies, **Fast Discretization of Parametric Surfaces**, 2009 SIAM/ACM Joint Conference on Geometric and Physical Modeling, October 5-8, 2009.

H. Erdim and H. Ilies, **Classifying Points for Solid Sweeping**, 10th SIAM Conference on Geometric Design and Computing, November 4-8 2007.

H. Ilies and V. Shapiro, **Point Membership Classification for Sweeps and Unsweeps**, Fifth SIAM conference on Geometric Design, Nashville, TN, Nov. 1997.

Theses

Ph.D., **On Shaping Moving Mechanical Parts**, University of Wisconsin - Madison, June 2000.

M.S., **Plasticity of Random Media**, Michigan State University, May 1995.

Inginer Licentiat (M.S.), **Stability of Fractal Dimension of the Topographic Data Collected from Shot Blasted Surfaces**, Technical University of Cluj, Romania, June 1993.