Curriculum Vitae

İlker Temizer

Professor

Department of Mechanical Engineering
Bilkent University

Personal Data

Date & Place of Birth: İzmir, Turkey (1979)

Address :	Department of Mechanical Engineering	Phone	:	(+90)(312) 290 3064
	Bilkent University	Fax	:	(+90)(312) 266 4126
	06800 Bilkent, Ankara	E-mail	:	temizer @ bilkent.edu.tr
	Turkey	Url	:	http://me.bilkent.edu.tr

Academic Degrees

2013	*Doçent (YÖK)*	Associate Professor Degree from the Turkish Higher Education Council
2005	*Doctor of Philosophy*	in Mechanical Engineering, University of California, Berkeley (USA)
2003	*Master of Science*	in Mechanical Engineering, University of California, Berkeley (USA)
2001	*Bachelor of Science*	in Mechanical Engineering, Boğaziçi Üniversitesi (İstanbul, Turkey)

Employment History

2021 (Nov.) – present	*Professor* Department of Mechanical Engineering Bilkent University (Turkey)
2014 (Oct.) – 2021 (Oct.)	*Associate Professor* Department of Mechanical Engineering Bilkent University (Turkey)
2010 (Sept.) – 2014 (Sept.)	*Assistant Professor* Department of Mechanical Engineering Bilkent University (Turkey)
2009 (Sept.) – 2010 (Aug.)	*Junior Research Group Leader in the Graduate School MUSIC (Multi-Scale Methods for Interface Coupling)* Leibniz Universität Hannover (Germany)
2006 (Feb.) – 2010 (Aug.)	*Post-Doctoral Researcher* Institute of Continuum Mechanics (IKM) Leibniz Universität Hannover (Germany) *Mentor*: Prof. Dr.–Ing. Peter Wriggers (IKM Director)
2001 (Aug.) – 2005 (Dec.)	*Graduate Student* Department of Mechanical Engineering University of California, Berkeley (USA) *Supervisor*: Prof. Tarek I. Zohdi

Scholarly Publications

Articles in Refereed Journals

(Advised/co-advised students and researchers are underlined. Corresponding authors are marked with †.)

50. Koç, S. I.,**Temizer, İ.**, Biancofiore, L.† (2025). Multiscale analysis and texture design for hydrodynamically lubricated interfaces with variable viscosity and density liquids, *Int. J. Solids Struct.*, 323:113640.

49. **Temizer, İ.**† (2025). On the identification and finite element treatment of macroscopic stress in Kohn-Sham density functional theory, *Comput. Methods Appl. Mech. Engrg.*, 435:117629.

48. Pekol, S., Kılınç, Ö., **Temizer, İ.**† (2024). A Computational Design Framework for Lubrication Interfaces with Active Micro-Textures, *ASME Journal of Tribology*, 146:122101.

47. Keleş, A. F., **Temizer, İ.**†, Çakmakcı, M. (2024). Homogenization-Based Space-Time Topology Optimization of Tunable Microstructures, *International Journal for Multiscale Computational Engineering*, 22:15-34.

46. Yalçın, M. A., **Temizer, İ.**† (2023). Hybrid Finite Element / Multipole Expansion Method for Atomic Kohn-Sham Density Functional Theory Calculations, *Computer Physics Communications*, 286:108658.

45. Mozafari, F.†, **Temizer, İ.** (2023). Computational homogenization of fatigue in additively manufactured microlattice structures, *Computational Mechanics*, 71:367-384.

44. Karaca, K., **Temizer, İ.**† (2023). Variationally consistent Hellmann-Feynman forces in the finite element formulation of Kohn-Sham density functional theory, *Comput. Methods Appl. Mech. Engrg.*, 403:115674.

43. **Temizer, İ.**† (2021). Radial and three-dimensional nonlocal pseudopotential calculations in gradient-corrected Kohn-Sham density functional theory based on higher-order finite element methods, *Comput. Methods Appl. Mech. Engrg.*, 386:114094.

42. **Temizer, İ.**†, Motamarri, P., Gavini, G. (2020). NURBS-based Non-Periodic Finite Element Framework for Kohn-Sham Density Functional Theory Calculations, *J. Comput. Phys.*, 410:109364.

41. Özcan, M., Çakmakcı, M., **Temizer, İ.**† (2020). Smart Composites with Tunable Stress-Strain Curves, *Computational Mechanics*, 65:375-394.

40. Çakal, B.A., **Temizer, İ.**†, Terada, K., Kato, J. (2019). Microscopic Design and Optimization of Hydrodynamically Lubricated Dissipative Interfaces, *International Journal for Numerical Methods in Engineering*, 120:153-178.

39. Nishi, S.†, Terada, K.†, **Temizer, İ.** (2019). Isogeometric analysis for numerical plate testing of dry woven fabrics involving frictional contact at meso-scale. *Computational Mechanics*, 64:211-229.

38. Yıldıran, İ. N., **Temizer, İ.**†, Çetin, B. (2017). Homogenization in Hydrodynamic Lubrication: Microscopic Regimes and Re-Entrant Textures. *ASME Journal of Tribology*, 140:011701(1-19).

37. Waseem, A., **Temizer, İ.**†, Kato, J., Terada, K. (2017). Micro-Texture Design and Optimization in Hydrodynamic Lubrication via Two-Scale Analysis. *Struct. Multidisc. Optim.*, 56:227-248.

36. Waseem, A., Guilleminot, J.†, **Temizer, İ.** (2017). Stochastic Multiscale Analysis in Hydrodynamic Lubrication. *Int. J. Numer. Meth. Engrg.*, 112:1070-1093.

35. Kılıç, K. İ., **Temizer, İ.**† (2016). Tuning Macroscopic Sliding Friction at Soft Contact Interfaces: Interaction of Bulk and Surface Heterogeneities. *Tribology International.*, 104:83-97.

34. Waseem, A., **Temizer, İ.**†, Kato, J., Terada, K. (2016). Homogenization-Based Design of Surface Textures in Hydrodynamic Lubrication. *Int. J. Numer. Meth. Engrg.*, 108:1427-1450.

33. **Temizer, İ.**†, Stupkiewicz, S. (2016). Formulation of the Reynolds Equation on a Time-Dependent Lubrication Surface. *Proc. R. Soc. A*, 472:20160032.

32. **Temizer, İ.**† (2016). Sliding Friction Across the Scales: Thermomechanical Interactions and Dissipation Partitioning. *J. Mech. Phys. Solids*, 89:126-148.

31. Hesch, C.†, Franke, M, Dittmann, M., **Temizer, İ.** (2016). Hierarchical NURBS and a higher-order phase-field approach to fracture for finite-deformation contact problems. *Comput. Methods Appl. Mech. Engrg.*, 301:242-258.

30. **Temizer, İ.**†, Hesch, C. (2016). Hierarchical NURBS in Frictionless Contact. *Comput. Methods Appl. Mech. Engrg.*, 299:161-186.

29. Kabacaoğlu, G., **Temizer, İ.**† (2015). Homogenization of soft interfaces in time-dependent hydrodynamic lubrication. *Computational Mechanics*, 56:421-441.

28. **Temizer, İ.**† (2014). Computational Homogenization of Soft Matter Friction: Isogeometric Framework and Elastic Boundary Layers. *Int. J. Numer. Meth. Engrg.*, 100:953-981.

27. **Temizer, İ.**†, Abdalla, M.M., Gürdal, Z. (2014). An Interior Point Method for Isogeometric Contact. *Comput. Methods Appl. Mech. Engrg.*, 276:589-611.

26. Dittmann, M., Franke, M., **Temizer, İ.**, Hesch, C.† (2014). Isogeometric Analysis and thermomechanical mortar contact problems. *Comput. Methods Appl. Mech. Engrg.*, 274:192-212.

25. Wu, T.†, **Temizer, İ.**, Wriggers, P. (2014). Multiscale Hydro-Thermo-Chemo-Mechanical Coupling: Application to Alkali-Silica Reaction. *Comput. Mat. Sci.*, 84:381-395.

24. **Temizer, İ.**† (2014). Multiscale Thermomechanical Contact: Computational Homogenization with Isogeometric Analysis. *Int. J. Numer. Meth. Engrg.*, 97:582-607.

23. **Temizer, İ.**† (2013). Granular Contact Interfaces with Non-Circular Particles. *Tribology International*, 67:229-239.

22. **Temizer, İ.**†, Wu, T., Wriggers, P. (2013). On the Optimality of the Window Method in Computational Homogenization. *Int. J. Eng. Sci.*, 64:66-73.

21. **Temizer, İ.**† (2013). A Mixed Formulation of Mortar-Based Contact with Friction. *Comput. Methods Appl. Mech. Engrg.*, 255:183-195.

20. Wu, T.†, **Temizer, İ.**, Wriggers, P. (2013). Computational Thermal Homogenization of Concrete. *Cement & Concrete Composites*, 35:59-70.

19. Budt, M.†, **Temizer, İ.**, Wriggers, P. (2012). A Computational Homogenization Framework for Soft Elastohydrodynamic Lubrication, *Computational Mechanics*, 49:749-767.

18. **Temizer, İ.**† (2012). A Mixed Formulation of Mortar-Based Frictionless Contact. *Comput. Methods Appl. Mech. Engrg.*, 223-224:173-185.

17. **Temizer, İ.**† (2012). On the Asymptotic Expansion Treatment of Two-Scale Finite Thermoelasticity. *Int. J. Eng. Sci.*, 53:74-84.

16. **Temizer, İ.**†, Wriggers, P., Hughes, T.J.R. (2012). Three-Dimensional Mortar-Based Frictional Contact Treatment in Isogeometric Analysis with NURBS. *Comput. Methods Appl. Mech. Engrg.*, 209-212:115-128.

15. De Lorenzis, L.†, **Temizer, İ.**, Wriggers, P., Zavarise, G. (2011). A large deformation frictional contact formulation using NURBS-based isogeometric analysis. *Int. J. Numer. Meth. Engrg.*, 87:1278-1300.

[The following works were completed during post-doctoral research.]

14. **Temizer, İ.**†, Wriggers, P., Hughes, T.J.R. (2011). Contact Treatment in Isogeometric Analysis with NURBS. *Comput. Methods Appl. Mech. Engrg.*, 200:1100-1112.

13. Ma, J.†, **Temizer, İ.**, Wriggers, P. (2011). Random homogenization analysis in linear elasticity based on analytical bounds and estimates. *Int. J. Solid Struct.*, 48:280-291.

12. **Temizer, İ.**† (2011). Thermomechanical Contact Homogenization with Random Rough Surfaces and Microscopic Contact Resistance. *Tribology International*, 44:114-124.

11. **Temizer, İ.**†, Wriggers, P. (2011). Homogenization in Finite Thermoelasticity. *J. Mech. Phys. Solids*, 59:344-372.

10. **Temizer, İ.**†, Wriggers, P. (2011). An adaptive multiscale resolution strategy for the finite deformation analysis of microheterogeneous structures. *Comput. Methods Appl. Mech. Engrg.*, 200:2639-2661.

9. **Temizer, İ.**†, Wriggers, P. (2010). Inelastic analysis of granular interfaces via computational contact homogenization. *Int. J. Numer. Meth. Engrg.*, 84:883-915.

8. **Temizer, İ.**†, Wriggers, P. (2010). Thermal contact conductance characterization via computational contact homogenization: A finite deformation theory framework. *Int. J. Numer. Meth. Engrg.*, 83:27-58.

7. **Temizer, İ.**†, Wriggers, P. (2010). A micromechanically motivated higher-order continuum formulation of linear thermal conduction. *Z. Angew. Math. Mech.*, 90 (10-11): 768-782.

6. **Temizer, İ.**†, Wriggers, P. (2008). On the computation of the macroscopic tangent for multiscale volumetric homogenization problems. *Comput. Methods Appl. Mech. Engrg.*, 198 (3-4): 495-510.

5. **Temizer, İ.**†, Wriggers, P. (2008). A multiscale contact homogenization technique for the modeling of third bodies in the contact interface. *Comput. Methods Appl. Mech. Engrg.*, 198 (3-4): 377-396.

4. **Temizer, İ.**†, Wriggers, P. (2008). On a mass conservation criterion in homogenization. *ASME Journal of Applied Mechanics*, 75:054503.

3. **Temizer, İ.**†, Wriggers, P. (2007). An adaptive method for homogenization in orthotropic nonlinear elasticity. *Comput. Methods Appl. Mech. Engrg.*, 196 (35-36):3409-3423.

[**The following works were completed during MS/PhD research.**]

2. **Temizer, İ.**†, Zohdi, T. I. (2007). A numerical method for homogenization in non-linear elasticity. *Computational Mechanics*, 40 (2):281-298.

1. **Temizer, İ.**†, Zohdi, T. I.† (2005). Agglomeration and refragmentation in microscale granular flows. *International Journal of Fracture*, 131 (3):L37-L44.

Dissertations

2. Temizer, İ. (2005). *Homogenization in Linear and Non-Linear Elasticity.* PhD thesis, University of California, Berkeley, California (USA). (*Supervisor*: Prof. T. I. Zohdi)

1. Temizer, İ. (2003). *A Model for Aggregation in a Class of Granular Materials.* MS thesis, University of California, Berkeley, California (USA). (*Supervisor*: Prof. T. I. Zohdi)

Online Lecture Material

Lecture Notes on Micromechanics and Homogenization (238 pages)
The lecture material, with Fortran and MATLAB codes for the accompanying exercises, is available for free download at `http://sourceforge.net/projects/multiscale`

Lecture Videos on Solid Mechanics Courses
Lectures for the following elective courses are available online at the Bilkent University YouTube channel (`https://www.youtube.com/BilkentUniversitesi`):

1. **ME446** (Applications of Solid Mechanics) / undergraduate-level course
2. **ME550** (Continuum Mechanics) / graduate-level course

Lecture-laboratory-recitation videos of a 2nd-year core curriculum course are also available online at the YouTube channel `Mechanics and Materials II`:

3. **ME232** (Mechanics and Materials II) / undergraduate-level course

Research Grants

11. *"Adaptive enriched finite element analysis for Kohn-Sham density functional theory calculations: Development of a numerical framework and its application to nanomechanics problems"*
Funding Agency: TÜBİTAK – 1001 project (125M374)
Research Funds: 2,227,692 TL (46,000 EUR) – 05.11.2025-05.05.2028 (30 months)
Status / Position: ongoing / principal (sole) investigator

10. *"Multiscale modelling and texture design for lubricated interfaces with non-Newtonian fluids"*
Funding Agency: TÜBİTAK – 1001 project (221M576)
Research Funds: 635,140 TL (42,000 EUR) – 01.03.2022-01.03.2025 (36 months)
Status / Position: completed / researcher (principal investigator: L. Biancofiore)

9. *"Accelerated Micromechanics and Design of 3D-Printed Porous Metals Under Fatigue Loading"*
Funding Agency: EU Horizon 2020 Program – TÜBİTAK CoCirculation2 – 2236 project (120C072)
Research Funds: 143,520 EUR – 01.11.2020-01.11.2022 (2 years)
Status / Position: completed / consultant (post-doctoral researcher: F. Mozafari)

8. *"NURBS-based Finite Element Analysis Framework for Kohn-Sham Density Functional Theory"*
   Funding Agency: TÜBİTAK – 1001 project (119M981)
   Research Funds: 398,000 TL (60,000 EUR) – 01.03.2020-01.01.2023 (24+10 months)
   Status / Position: completed / principal (sole) investigator

7. *"Hierarchical Isogeometric Analysis Technology and Computational Contact Mechanics"*
   Funding Agency: TÜBİTAK – 1001 project (115M678)
   Research Funds: 163,500 TL (50,000 EUR) – 01.09.2015-01.09.2017 (24 months)
   Status / Position: completed / principal (sole) investigator

6. *"Multiscale Analysis and Micro-Texture Design for Lubrication Interfaces"*
   Funding Agency: TÜBİTAK – 1001 project (114M406)
   Research Funds: 152,880 TL (53,000 EUR) – 15.10.2014-15.04.2017 (30 months)
   Status / Position: completed / principal (sole) investigator

5. *"MultiscaleFSI: Multiscale Fluid-Solid Interaction in Heterogeneous Materials and Interfaces"*
   Funding Agency: EU-FP7 (European Union 7th Framework Programme) – Marie Curie CIG project
   Research Funds: 100,000 EUR – 01.10.2012-01.10.2016 (4 years)
   Status / Position: completed / principal (sole) investigator

4. *"Granular Contact Interfaces with Non-Circular Particles"*
   Funding Agency: Michelin Tire Company
   Research Funds: 12,000 EUR – 2011-2012 (6 Months)
   Status / Position: completed / principal (sole) investigator

3. *"Thermomechanical homogenization techniques for metallic and polymeric microrough contact interfaces: theoretical foundations, numerical modelling and multiscale implementation"*
   Funding Agency: TÜBİTAK – 3501 project (110M661)
   Research Funds: 141,080 TL (64,000 EUR) – 15.04.2011-15.10.2013 (30 months)
   Status / Position: completed / principal (sole) investigator

[The following grants were obtained during post-doctoral research.]

2. *"Multiscale Contact Homogenization of Granular Interfaces"*
   Funding Agency: DFG (German Research Foundation – WR 19/41)
   Research Funds: 216,000 EUR – 2009-2012 (3 years)
   Status / Position: completed / researcher (principal investigator: Prof. P. Wriggers)

1. *"Adaptive Multiscale Modeling and Analysis of Heterogeneous Materials"*
   Funding Agency: DFG (German Research Foundation – WR 19/36)
   Research Funds: 340,000 EUR – 2007-2013 (3+3 years)
   Status / Position: completed / researcher (principal investigator: Prof. P. Wriggers)

Research Supervision

Post-Doctoral Researchers

Farzin Mozafari (Oct. 2020 – Oct. 2022). Marie Skłodowska-Curie Research Fellow, Bilkent University (next position: Asst. Prof. at Abdullah Gül University)

Graduate Students

10. Tarık Mumcu (Sept. 2025 –). MS thesis, Bilkent University.

9. Yunus Altıntop (Sept. 2022 – Aug. 2025). *On Density Functional Perturbation Theory With The Finite Element Method.* MS thesis, Bilkent University.

8. Berkan Dedeoğlu (Sept. 2021 – Aug. 2024). *Homogenization-Based Computational Design and Two-Scale Performance Optimization of Electroactive Structures.* MS thesis, Bilkent University.

7. Sarp Ilgaz Koç (Sept. 2021 – Aug. 2024). *Multiscale Analysis and Texture Design for Interfaces Hydrodynamically Lubricated by Variable Viscosity and Density Liquids.* MS thesis, Bilkent University. (*Co-advisor*: L. Biancofiore)

6. Sena Pekol (Sept. 2020 – Aug. 2023). *Active Lubrication Interfaces With Tunable Micro-Textures.* MS thesis, Bilkent University.

5. Kaan Karaca (Sept. 2018 – Sept. 2021). *Geometry Optimization with Variationally Consistent Forces Using Higher-Order Finite Element Methods in Kohn-Sham Density Functional Theory Calculations.* MS thesis, Bilkent University.

4. Müge Özcan (Sept. 2016 – Dec. 2018). *Smart Composites with Tunable Stress-Strain Curves.* MS thesis, Bilkent University. (*Co-advisor*: M. Çakmakcı)

3. Abdullah Waseem (Sept. 2013 – Aug. 2016). *Homogenization-based Microscopic Texture Design and Optimization in Hydrodynamic Lubrication.* MS thesis, Bilkent University.

[The following graduate students had external affiliation.]

2. Tao Wu (2014). *Multiscale Chemo-Thermal-Mechanical Modeling and Analysis of Concrete.* Ph.D. thesis, Leibniz Universität Hannover (Germany). (*Co-advisor*: Prof. P. Wriggers)

1. Michael Budt (2011). *Computational Homogenization Framework for Soft Elasto-Hydrodynamic Lubrication.* Ph.D. thesis, Leibniz Universität Hannover (Germany). (*Co-advisor*: Prof. P. Wriggers)

Undergraduate Students

14. Ada Deniz Koç (ongoing). UG Research, *Ab Initio Stress Calculations.* Bilkent University.

13. Tarık Mumcu (graduated in Spring 2025 – continued as a MS student). UG Research, Bilkent University.

12. Özge Kılınç (graduated in Spring 2022 – next position: MS student at Politecnico di Milano). *Space-Time Topology Optimization of Smart Surfaces.* UG Research, Bilkent University. [**see Publications for a journal paper**]

11. Zehra Betül Şen (graduated in Spring 2022 – next position: PhD student at Yale University). *Adaptive integration for enriched finite element calculations.* UG Research, Bilkent University.

10. Yunus Altıntop (graduated in Spring 2022 – continued as a MS student). UG Research, Bilkent University.

9. Sarp Ilgaz Koç (graduated in Spring 2021 – continued as a MS student). UG Research, Bilkent University. (*Co-advisor*: L. Biancofiore)

8. Ahmet Keleş (graduated in Spring 2021 – next position: MS student at Bilkent University). *Homogenization-Based Space-Time Topology Optimization of Tunable Microstructures.* UG Research, Bilkent University. (*Co-advisor*: M. Çakmakcı) [**see Publications for a journal paper**]

7. Muhammed Aybars Yalçın (graduated in Spring 2020 – next position: TAI). *Hybrid Finite Element / Multipole Expansion Method for Atomic Kohn-Sham Density Functional Theory Calculations.* UG Research, Bilkent University. [**see Publications for a journal paper**]

6. Sena Pekol (graduated in Spring 2020 – continued as a MS student). UG Research, Bilkent University.

5. Berkay Alp Çakal (graduated in Spring 2017 – next position: MS student at the Technical University of Munich). *Microscopic Design and Optimization of Hydrodynamically Lubricated Dissipative Interfaces.* UG Research, Bilkent University. [**see Publications for a journal paper**]

4. İbrahim N. Yıldıran (graduated in Spring 2016 – next position: PhD student at Koç University). *Homogenization in Hydrodynamic Lubrication: Microscopic Regimes and Non-Conventional Textures.* UG Research, Bilkent University. (*Co-advisor*: B. Çetin) [**see Publications for a journal paper**]

3. Müge Özcan (graduated in Spring 2016 – continued as a MS student). UG Research, Bilkent University. (*Co-advisor*: M. Çakmakcı)

2. Karsu İpek Kılıç (graduated in Spring 2016 – next position: PhD student at Stanford University). *Tuning Macroscopic Sliding Friction at Soft Interfaces: Interaction of Bulk and Surface Heterogeneities.* UG Research, Bilkent University. [**see Publications for a journal paper**]

1. Gökberk Kabacaoğlu (graduated in Spring 2014 – next position: PhD student at the University of Texas, Austin). *Homogenization-based Multiscale Modeling of Lubricated Interfaces.* UG Research, Bilkent University. [**see Publications for a journal paper**]

Research Interests

Contrary to modelling macroscopic physical phenomena through phenomenological observations, I concentrate on lower-scale models that capture the essential physics and which interact to automatically display rich upper-scale behaviour, where the scale transition is achieved through computational homogenization. The research topics in *computational mechanics* that define my experience in *multiscale and multiphysics modeling* are associated with the homogenization-based analysis and design of heterogeneous materials and interfaces. My current research efforts are primarily focused on density functional theory calculations which explore the advantages of the finite element method.

Past and Present Research Collaborators

- Luca Biancofiore (Bilkent University)
- Vikram Gavini and Phani Motamarri (University of Michigan, Ann Arbor, USA)
- Melih Çakmakcı (Bilkent University)
- Barbaros Çetin (Bilkent University)
- Johann Guilleminot (Université Paris-Est, France)
- Stanisław Stupkiewicz (Institute of Fundamental Technological Research, Poland)
- Kenjiro Terada and Junji Kato (Tohoku University, Japan)
- Christian Hesch (Karlsruhe Institute of Technology, Germany)
- Mostafa Abdalla and Zafer Gürdal (Delft University of Technology, Netherlands)

- Thomas J. R. Hughes (University of Texas at Austin, USA)
- Peter Wriggers (Leibniz Universität Hannover, Germany)

Honors and Scholarly Activities

Honors and Awards

2022 Most Inspiring Teacher Award (student-voted event of the Mechanical Engineering Department)
2022 Distinguished Teaching Award of Bilkent University
2021 Most Inspiring Teacher Award (student-voted event of the Mechanical Engineering Department)
2018 Turkish Academy of Sciences – Distinguished Young Scientist Award (TÜBA-GEBİP)
2015 Mustafa Parlar Foundation – Young Investigator Research Incentive Award
2015 The Science Academy, Turkey – Distinguished Young Scientist Award (BAGEP)
2001 Boğaziçi Üniversitesi (İstanbul, Turkey) – Graduation Class Rank 1

Scholarly and Professional Activities

5. Sabbatical leave during the 2016-2017 academic year at the University of Michigan, Ann Arbor (USA) and at the Tohoku University (Sendai, Japan).

4. Invited stay (*visiting professor*) at the Laboratory for Multi-Scale Modeling and Simulation, Université Paris-Est Marne-la-Vallée. *Host:* J. Yvonnet and Q.C. He. (January 14-31, 2014)

3. Invited visit to the International Research Instituite of Disaster Science, Tohoku University. *Host:* J. Kato and K. Terada (October 17, 2013)

2. Invited stay (*visiting researcher*) at the Institute for Computational Engineering and Sciences, University of Texas at Austin. *Host:* T. J. R. Hughes. (January 11-31,2012)

1. *1st MUSIC Summer School (September 15-17, 2010), Hannover (Germany)* – "Multiscale and Multiphysics Modeling of Interfaces" [Organizer: in cooperation with Britta Hirschberger]

Teaching

(*The teaching requirement at Bilkent University is 2 courses per semester. The semesters when 2 sections of the same course are taught instead are marked with* †. *Video recorded semesters are marked with* •. *Both semesters last 14 weeks. The number of lecture hours per week are shown in parentheses. Double-coded course titles are marked with* ‖.)

Graduate Courses

ME501 (3) Mathematical Techniques in Mechanical Engineering [Spring '11; Fall '11]
ME550 (3) Continuum Mechanics [Spring: '13–'16; Fall: '10, '17, '18$^{\bullet}$, '19–'21]
ME552 (3) Finite Element Method [Spring '11; Fall: '13, '15, '18, '23]
ME546 (3) Applications of Solid Mechanics$^{\|}$ [Fall: '24, '25]

Undergraduate Courses

ME101 (2) Introduction to Mechanical Engineering [Fall: '10, '11]
ME231 (4) Mechanics and Materials I [Fall: '12†, '13, '14, '17]
ME232 (4) Mechanics and Materials II [Spring: '12†, '13–'16, '18, '19†, '20$^{\dagger,\bullet}$, '21†–'24†]
ME446 (3) Applications of Solid Mechanics$^{\|}$ [Spring '18$^{\bullet}$; Fall: '14, '15, '19–'22, '24, '25]

Teaching Experience Prior to Bilkent

Leibniz Universität Hannover (Germany): Post-Doctoral Researcher

Primary Instructor (Lecture and Exercise): *Micromechanics* (Summer 2010) [with Wenzhe Shan]
Primary Instructor (Lecture and Exercise): *Micromechanics* (Summer 2007)
Secondary Instructor (Exercise): *Contact Mechanics* (Winter 2006)

University of California, Berkeley (USA): Graduate Student Instructor

Introduction to the Finite Element Method (Fall 2004, Fall 2003, Fall 2002)
Finite Element Methods in Nonlinear Continua (Spring 2005)
Mechanical Behavior of Engineering Materials (Fall 2005, Fall 2001)
Methods of Tensor Calculus and Differential Geometry (Fall 2005)

Departmental and University Service

- **MS Thesis Defence:** E. Gülümser (CS, 23.12.2011), H. İ. Dokuyucu (ME, 02.08.2012), C. Birlik (ME, 04.09.2012), B. Sert (IE, 29.05.2014), M. Ahmadi (ME, 25.12.2017), S. Firooz (ME, 18.06.2019), H. Ahmed (ME, 07.08.2019), Y.M. Korkmaz (ODTÜ-AE, 11.09.2019), S. S. Gamaniel (ME, 27.11.2020), T. I. Özcan (ODTÜ-AE, 08.12.2023), M. H. Sarı (ME, 19.07.2024)

  PhD Oral Exam: S. Nadimi (ME, 01.06.2012), V. T. Kılıç (EE, 23.05.2013), G. B. Bayraktar (ME, 11.06.2014), M. Ghasabeh (ODTÜ-CE, 21.05.2015), H. Gülaşık (ODTÜ-AE, 24.05.2016), M. Alkhaled (ME, 16.12.2019), H. Mohamed (ME, 26.05.2021), H. Ahmed (ME, 26.05.2021), O. Mohamed (ME, 03.12.2021)

  PhD Thesis Committee: S. Nadimi (ME), K. Yavuz (UNAM), H. Ahmed (ME)

  PhD Thesis Defence: A. Amireghbali (ODTÜ-AE, 12.01.2023), H. Ahmed (ME, 21.12.2023), K. Yavuz (UNAM, 18.12.2024), F. Matin (ME, 21.11.2025)

- Routinely involved in departmental duties such as curriculum review, lab equipment design and purchase, advising of undergraduates as well as ABET accreditation work
- Regularly presented the Mechanical Engineering Department to prospective students
- Member of the engineering faculty committee for the evaluation of MATH 101/102 (2012-2013 academic year) and MATH 101/102 & PHYS 101/102 course content (2015-2016 academic year)
- Departmental exchange program coordinator (Fall 2010 - Spring 2014)
- Departmental seminar series coordinator (Spring 2014 - Spring 2015)
- Departmental PhD qualification exam committee member (since 2021)
- Member of Search Committee for the Dean of Faculty of Engineering (May-August 2016)
- Member of Faculty Search Committee for the Mechanical Engineering Department (since Fall 2010)
- Faculty Executive Board (FYK) member (01.10.2015-31.08.2016 and 24.10.2018-12.10.2022)
- Vice Chair of the Mechanical Engineering Department (10.03.2014 - 30.09.2019)
- Chair of the Mechanical Engineering Department (01.06.2022 -)

Invited Talks

27. Temizer, İ. (October 10, 2023). Macroscopic Stress and Atomic Force in Kohn-Sham Density Functional Theory with Higher-Order Finite Elements. *II International Conference on Computational Modeling of Complex Materials Across the Scales (October 10-13, 2023), Eindhoven University of Science and Technology, Eindhoven (Netherlands).*

26. Temizer, İ. (June 24, 2017). Computational Contact Mechanics: Basis of IGA and its application to surface mechanics. *31st Nonlinear CAE Workshop (JANCAE), University of Tokyo, Tokyo (Japan).*

25. Temizer, İ. (May 1, 2017). Computational Frameworks for Materials and Interfaces: Homogenization Approaches and Algorithmic Aspects. *International Research Institute of Disaster Science, Tohoku University, Sendai (Japan).*

24. Temizer, İ. (February 23, 2016). Hierarchical NURBS in Frictionless Contact. *Institute of Applied Mathematics, Middle East Technical University, Ankara (Turkey).*

23. **[Keynote]** Temizer, İ. (May 25, 2015). Hierarchical NURBS in Frictionless Contact. *4^{th} International Conference on Computational Contact Mechanics (May 27-29, 2015), Leibniz Universität Hannover (Germany).*

22. Temizer, İ. (April 14, 2015). Computational Contact Mechanics: An Interplay between Finite Elements and Optimization. *Department of Mathematics, Bilkent University, Ankara (Turkey).*

21. Temizer, İ. (February 25, 2015). Soft Interface Friction Across the Scales: Thermomechanical Interactions and Dissipation Partitioning. *EUROMECH Colloquium: Multi-scale computational methods for bridging scales in materials and structures (February 23-25, 2015), Eindhoven University of Science and Technology, Eindhoven (Netherlands).*

20. Temizer, İ. (November 28, 2014). Optimization in Computational Interface Mechanics. *Department of Industrial Engineering, Bilkent University, Ankara (Turkey).*

19. Temizer, İ. (May 16, 2014). Hesaplamalı Temas Mekaniği: İzogeometrik Analiz, Harç Metodları, Karma Yaklaşımlar. *Department of Mechanical Engineering, Trakya University, Edirne (Turkey).*

18. **[Semi-Plenary]** Temizer, İ. (April 14, 2014). Computational Contact Mechanics: Isogeometric Analysis, Mortar Methods, Mixed Formulations. *Computational Engineering and Science for Safety and Environmental Problems (April 13-16, 2014), Sendai (Japan).*

17. Temizer, İ. (January 23, 2014). Computational Multiscale Tribology for Soft Interfaces. *Multiscale Modeling and Simulation Lab, Université Paris-Est Marne-la-Vallée (France).*

16. Temizer, İ. (October 17, 2013). Soft Matter Friction: Multiscale Basis and Computational Aspects. *International Institute of Disaster Science, Tohoku University, Sendai (Japan).*

15. Temizer, İ. (October 25, 2012). Thermodynamically- and Algorithmically-Consistent Nonlinear Homogenization Frameworks: Materials and Contact Interfaces. *Multiscale Modeling and Simulation Lab, Université Paris-Est Marne-la-Vallée. (France).*

14. Temizer, İ. (July 20, 2012). Homogenization-based Multiscale Analysis of Materials and Interfaces. *SIMTECH Cluster of Excellence, University of Stuttgart (Germany).*

13. **[Keynote]** Temizer, İ. (March 29, 2012). Multiphysics Interface Homogenization in Granular and Fluid Film Lubrication. *EUROMECH Colloquium: New Trends in Contact Mechanics (March 27-31, 2012), Cargese, Corsica (France).*

12. Temizer, İ., (September 30, 2011) Mortar-Based Contact Treatment in Isogeometric Analysis with NURBS. *Department of Naval Architecture and Ocean Engineering, Seoul National University (South Korea).*

11. Temizer, İ. (June 21, 2011). Mortar-Based Frictional Contact Treatment in Isogeometric Analysis with NURBS. *Institute of Aerospace Structures and Computational Mechanics, Delft University of Technology (Netherlands).*

10. [**Keynote**] Temizer, İ. (June 15, 2011). Multiphysics Homogenization Techniques: Thermoelasticity and Lubrication. *2^{nd} International Conference on Computational Contact Mechanics (June 15-17, 2011), Leibniz Universität Hannover (Germany).*

9. Temizer, İ. (June 29, 2010). Thermodynamics of Homogenization for Materials and Contact Interfaces at Finite Deformations. *Institute of Mechanics, TU München, Munich (Germany).*

8. Temizer, İ. (June 24, 2010). Thermodynamics of Homogenization for Materials and Contact Interfaces at Finite Deformations. *Institute of Mechanics, TU Dortmund, Dortmund (Germany).*

7. Temizer, İ. (February 19, 2010). Computational Contact Homogenization Techniques for Multiphysics Problems. *Department of Mechanical Engineering, Bilkent University, Ankara (Turkey).*

6. [**Summer School**] *School of Multiscale Modelling of Materials and Structures (September 9-11, 2009), Zakopane (Poland)*: 18×45min invited lectures at the summer school organized by the University of Technology in Czestochowa and by the Section of Mechanics of Structures and Materials of the Committee for Civil Engineering of Polish Academy of Science [in cooperation with Varvara Kouznetsova and Stefan Löhnert]

5. Temizer, İ. (October 7, 2009). Computational Contact Homogenization Techniques for Multiphysics Problems. *Faculty of Engineering and Natural Sciences, Sabancı University, İstanbul (Turkey).*

4. Temizer, İ. (April 29, 2009). Contact homogenization methodologies: Theoretical and numerical frameworks. *Institute of Mechanics, Army University, Munich (Germany).*

3. Temizer, İ. (December 03, 2008). Strategies for the finite deformation analysis of microheterogeneous structures and systems: Multiscale aspects and adaptivity. *Department of Applied Mechanics, Chalmers University of Technology, Göteborg (Sweden).*

2. Temizer, İ. (April 15, 2008). Multiscale Analysis Methodologies for Volumetric and Contact Homogenization Problems. *Department of Mechanical and Manufacturing Engineering, University of Calgary, Calgary (Canada).*

1. Temizer, İ. (March 4, 2008). Multiscale Analysis Methodologies for Volumetric and Contact Homogenization Problems. *Department of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge (USA).*

Conference Presentations

(*The presentation is held by the first person. Advised and co-advised names are underlined.*)

42. Koç, S. I., Temizer, İ., Biancofiore, L. (August 30, 2024). Multiscale Analysis and Texture Design for Interfaces Hydrodynamically Lubricated by Variable Viscosity and Density Liquids. *26th International Congress of Theoretical and Applied Mechanics (August 25-30, 2024), Daegu (Korea).*

41. Koç, S. I., Temizer, İ., Biancofiore, L. (September 18, 2023). Multiscale Analysis and Texture Design for Interfaces Hydrodynamically Lubricated by Variable Viscosity and Density Liquids. *8th International Conference on Micro and Nano Flows (September 18-20, 2023), Padova (Italy).*

40. Karaca, K., Temizer, İ. (June 6, 2022). Kohn-Sham Density Functional Theory Calculations with Isogeometric Analysis. *8th European Congress on Computational Methods in Applied Sciences and Engineering Mechanics (ECCOMAS) (June 5-9, 2022), Oslo (Norway).*

39. Mozafari, F., Temizer, İ. (June 6, 2022). Macroscopic fatigue life prediction of 3D-printed metallic microlattice materials. *8th European Congress on Computational Methods in Applied Sciences and Engineering Mechanics (ECCOMAS) (June 5-9, 2022), Oslo (Norway).*

38. Temizer, İ., Motamarri, P., Gavini, V. (July 29, 2019). NURBS-based Non-Periodic FEM Framework for Kohn-Sham Density Functional Theory. *15th U.S. National Congress on Computational Mechanics (USNCCM) (28 July - 1 August, 2019), Austin (USA).*

37. Waseem, A., Temizer, İ., Kato, J. and Terada, K. (June 8, 2016). Homogenization-Based Design and Optimization of Lubrication Interface Textures. *7th European Congress on Computational Methods in Applied Sciences and Engineering Mechanics (ECCOMAS) (June 5-10, 2016), Crete (Greece).*

36. Temizer, İ., Waseem, A., and Kabacaoğlu, G. (October 13, 2015). Homogenization-Based Design and Optimization of Lubrication Interface Textures. *3rd International Workshops on Advances in Computational Mechanics (IWACOM) (October 12-14, 2015), Tokyo (Japan).*

35. Temizer, İ. and Kabacaoğlu, G. (September 14, 2015). Homogenization of Soft Interfaces in Time-Dependent Hydrodynamic Lubrication. *11th European Conference on Numerical Mathematics and Advanced Applications (ENUMATH) (September 14-18, 2015), Ankara (Turkey).*

34. Temizer, İ. and Kabacaoğlu, G. (April 27, 2015). Homogenization of Soft Interfaces in Time-Dependent Hydrodynamic Lubrication. *1st Pan-American Congress on Computational Mechanics (PANACM) (April 27-29, 2015), Buenos Aires (Argentina).*

33. Temizer, İ. (July 21, 2014). Homogenization of Soft Interface Friction: Isogeometric Framework and Elastic Boundary Layers. *11th World Congress on Computational Mechanics (WCCM) (July 20-25, 2014), Barcelona (Spain).*

32. Temizer, İ., Abdalla, M.M. and Gürdal, Z. (June 16, 2014). An Interior Point Method for Isogeometric Contact. *17th U.S. National Congress on Theoretical & Applied Mechanics (USNCTAM) (June 15-20, 2014), Michigan (USA).*

31. Temizer, İ. and Kabacaoğlu, G. (April 14, 2014). Homogenization-based Multiscale Modeling of Lubricated Interfaces. *Computational Engineering and Science for Safety and Environmental Problems (April 13-16, 2014), Sendai (Japan).*

30. Kabacaoğlu, G. and Temizer, İ. (July 24, 2013). Homogenization-based Multiscale Modeling of Lubricated Interfaces. *12th U.S. National Congress on Computational Mechanics (USNCCM) (July 22-25, 2013), Raleigh (USA).*

29. Temizer, İ. (July 23, 2013). Sliding Friction Across the Scales: Thermomechanical Interactions and Dissipation Partitioning. *12th U.S. National Congress on Computational Mechanics (USNCCM) (July 22-25, 2013), Raleigh (USA).*

28. Wu, T., Temizer, İ. and Wriggers. (June 19, 2013). A Multiscale Method to analyze the deterioration due to Alkali Silica Reaction considering the effects of temperature and relative humidity. *V International Conference on Coupled Problems in Science and Engineering (June 17-19, 2013), Ibiza (Spain).*

27. Temizer, İ. (October 22, 2012). Homogenization-based Scale Transitions in Finite Deformation Thermomechanics . *1st International Workshop on Physics Based Modeling of Material Properties and Experimental Observations (22-23 October 2012), Ankara (Turkey).*

26. Temizer, İ. (September 12, 2012). Computational Multiscale Modeling of Thermomechanical Contact. *6th European Congress on Computational Methods in Applied Sciences and Engineering Mechanics (ECCOMAS) (10-14 September 2012), Vienna (Austria).*

25. Hajibeik, N., Temizer, İ., Löhnert, S. and Wriggers, P. (September 12, 2012). Scale adaptivity for a multiscale analysis of composite substructures. *6th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS) (10-14 September 2012), Vienna, Austria.*

24. Weidlich, R., Temizer, İ. and Wriggers, P. (September 12, 2012). A three-dimensional homogenization technique for granular interfaces. *6th European Congress on Computational Methods in Applied Sciences and Engineering Mechanics (ECCOMAS) (10-14 September 2012), Vienna (Austria).*

23. Wu, T., Temizer, İ. and Wriggers, P. (July 19, 2012). Multiscale Modeling of Alkali Silica Reaction Induced Damage in Concrete: Coupled Hydro-Chemical and Thermo-Mechanical Effects. *10th World Congress On Computational Mechanics (WCCM) (8-13 July, 2012), Sao Paolo (Brazil).*

22. Temizer, İ. (April 27, 2012). Computational Contact Homogenization of Granular Interfaces. *1st ECCOMAS Young Investigators Conference (April 24-27, 2012), Aveiro (Portugal).*

21. Wu, T., Temizer, İ. and Wriggers, P. (March 28, 2012). Computational Thermal Homogenization of Concrete. *83rd Annual Meeting of the International Association of Applied Mathematics and Mechanics (GAMM) (March 26-30, 2012), Darmstadt (Germany).*

20. Hajibeik, N., Temizer, İ., Löhnert, S. and Wriggers, P. (September 22, 2011). Adaptive Multi-Scale Failure Analysis based on Error Estimation. *Composites 2011, 3rd ECCOMAS Thematic Conference on the Mechanical Response of Composites (September 21-23, 2011), Hanover (Germany).*

19. Wu,T., Temizer, İ. and Wriggers, P. (September 8, 2011). A Method of Two-Scale Chemo-Thermal-Mechanical Coupling for Concrete. *XI International Conference on Computational Plasticity Fundamentals and Applications (September 7-9, 2011), Barcelona (Spain).*

18. Hajibeik, N., Temizer, İ., Löhnert, S. and Wriggers, P. (April 19, 2011). Adaptive Multiscale Failure Analysis based on Error Estimation. *82nd Annual Meeting of the International Association of Applied Mathematics and Mechanics (GAMM) (April 18-21, 2011), Graz (Austria).*

17. Wu, T., Temizer, İ. and Wriggers, P. (April 19, 2011). Computational Homogenization of Damage in the Hardened Cement Paste due to Alkali Silica Reaction. *82nd Annual Meeting of the International Association of Applied Mathematics and Mechanics (GAMM) (April 18-21, 2011), Graz (Austria).*

16. Temizer, İ., Budt and M., Wriggers, P. (April 19, 2011). Homogenization in Finite Deformation Elastohydrodynamic Lubrication. *82nd Annual Meeting of the International Association of Applied Mathematics and Mechanics (GAMM) (April 18-21, 2011), Graz (Austria).*

15. Temizer, İ., De Lorenzis, L., Wriggers, P. and Hughes, T.J.R. (January 15, 2011). Contact Treatment in Isogeometric Analysis with NURBS. *1st USACM Thematic Conference on Isogeometric Analysis (January 13-15, 2011), University of Texas, Austin (USA).*

[The following talks were given during post-doctoral research.]

14. Budt, M., Temizer, İ. and Wriggers, P. (July 22, 2010). Analysis of Lubricated Contact with Rough Surfaces. *9th World Congress on Computational Mechanics (July 19-23, 2010), Sydney (Australia).*

13. Temizer, İ. and Wriggers, P. (July 22, 2010). Multiscale Modeling of Thermal Conduction Through Heterogeneous Contact Interfaces. *9th World Congress on Computational Mechanics (July 19-23, 2010), Sydney (Australia).*

12. Temizer, İ. and Wriggers, P. (May 21, 2010). Space-Time Homogenization of Inelastic Contact Boundary Layers. *IV European Conference on Computational Mechanics (ECCM) (May 16-21, 2010), Paris (France).*

11. Temizer, İ. and Wriggers, P. (March 29, 2010). Homogenization Frameworks for Heterogeneous Contact Topographies. *2nd German-Japanese Workshop on Computational Mechanics (March 28-29, 2010), Yokohama (Japan).*

10. Temizer, İ. and Wriggers, P. (March 24, 2010). Homogenization in Finite Thermoelasticity. *81st Annual Meeting of the International Association of Applied Mathematics and Mechanics (GAMM) (March 22-26, 2010), Karlsruhe (Germany).*

9. Temizer, İ. and Wriggers, P. (September 18, 2009). Computational thermal contact conductance characterization. *1st International Conference on Computational Contact Mechanics (September 16-18, 2009), University of Solento, Lecce (Italy).*

8. Wriggers, P. and Temizer, İ. (July 18, 2009). On multi-scale methods in computational contact mechanics: Multiphysics homogenization methodologies. *10th U.S. National Congress on Computational Mechanics (USNCCM) (July 16-19, 2009), Columbus (USA).*

7. Wriggers, P. and Temizer, İ. (June 14, 2009). Strategies for the finite deformation analysis of microheterogeneous structures and systems: Multiscale aspects and adaptivity. *Computational Multiscale Methods (June 14-20 2009), Mathematisches Forschungsinstitut Oberwolfach (Germany).*

6. Temizer, İ. and Wriggers, P. (February 12, 2009). A contact homogenization framework for granular interfaces. *80th Annual Meeting of the International Association of Applied Mathematics and Mechanics (GAMM) (February 9-13, 2009), Gdańsk (Poland).*

5. Temizer, İ. and Wriggers, P. (July 3, 2008). An adaptive multiscale resolution strategy for the analysis of microheterogeneous structures. *8th World Congress on Computational Mechanics (June 30 - July 4, 2008), Venice (Italy).*

4. Temizer, İ. and Wriggers, P. (April 2, 2008). On the computation of the macroscopic tangent for multiscale volumetric homogenization problems. *79th Annual Meeting of the International Association of Applied Mathematics and Mechanics (GAMM) (March 31 - April 4, 2008), Bremen (Germany).*

3. Temizer, İ. and Wriggers, P. (July 23, 2007). A multiscale contact homogenization technique for the modeling of third bodies in the contact interface. *9th U.S. National Congress on Computational Mechanics (USNCCM) (July 23-26, 2007), San Francisco (USA).*

2. Temizer, İ. and Wriggers, P. (May 8, 2007). A database approach to homogenization. *First Seminar on the Mechanics of Multifunctional Materials (May 7-10, 2007), Bad Honnef (Germany).*

1. Temizer, İ. and Wriggers, P. (September 19, 2006). A numerical method for homogenization in isotropic and anisotropic nonlinear elasticity. *Third International Conference on Multiscale Materials Modeling (September 18-22, 2006), Freiburg (Germany).*