Murat BUYUK, *Ph.D.*

1. Personal Information:

Name : **Murat BÜYÜK**
Phone : +90 (507) 048-7847
Nationality : Turkish, 44266429120
Current Position : Lecturer – Middle East Technical University (METU)
Address : Middle East Technical University (METU)
Department of Engineering Sciences, MM Building, 9th Floor, Room 902
Üniversiteler Mah. Dumplupınar Blvd. No:1, 06800 Ankara, Turkey
E-Mail(s) : mbuyuk@metu.edu.tr | muratbuyuk@sabanciuniv.edu.tr | mbuyuk@gmail.com
Links : ***Google Scholar*** | ***ORCID*** | ***linkedin*** | ***ResearchGate***

2. Academic Background:

Academic Degree	Field	University	Year
Doctoral **Ph.D.**	**Civil Engineering** **Major: Applied Mechanics**	**The George Washington University** www.gwu.edu	**2013**
Master's **M.Sc.**	**Mechanical Engineering** **Major: Applied Mechanics**	**Gebze Technical University** www.gtu.edu.tr	**2003**
Licence **B.Sc.**	**Mechanical Engineering**	**Yıldız Technical University** www.yildiz.edu.tr	**1999**

- **Doctoral Dissertation**

Development of a tabulated thermo-viscoplastic material model with regularized failure for dynamic ductile failure prediction of structures under impact loading [**Link**]
The George Washington University, School of Engineering and Applied Science, 2013.

- **Master's Thesis**

Finite Element Analysis and Optimum Design of Structures under Impact Loading [**Link**]
Gebze Institute of Technology, School of Engineering and Applied Science, 2003.

- **Diploma Thesis**

Stress Analysis of the Chassis Rails for GT-Model Military Jeep Vehicle by using Finite Element Method
Yıldız Technical University, Department of Mechanical Engineering, 1999.

3. Research & Scholarly Interests:

TIER - I	TIER - II	TIER - III
Computational & Applied Mechanics	**Transportation, Structural Safety & Security**	**Design, Optimization, Engineering Education**
▪ Computational Mechanics	▪ Transportation Safety & Security	▪ CAD / CAM / CAE / CIM / PLM /
▪ Continuum-Solid Mechanics	▪ Highway Safety & Security	▪ **C**onceive-**D**esign-**I**mplement-**O**perate [1]
▪ Finite Element Analysis	▪ Crashworthiness, Airworthiness	▪ **S**imulation-**B**ased **E**ngineering **S**cience [2]
▪ Structural Impact	▪ Automotive Regulations; UNECER, FMVSS-Type Certification	▪ Structural Design Optimization
▪ Elasticity-Plasticity	▪ Aviation Regulations EASA; FAA-Type Certification	▪ Multi-Objective/Disciplinary Optimization
▪ Molecular Dynamics	▪ Occupant-Pedestrian-Child Safety	▪ Topology Optimization
▪ Contact Mechanics	▪ Motorcycle- Bicycle Crashworthiness	▪ Validation & Verification
▪ Meshfree-Meshless Methods	▪ Spacecraft-Satellite Safety & Security	▪ Uncertainty Quantification
▪ Fracture - Failure Mechanics	▪ Public Safety & Security	▪ Lightweight Vehicle - Automobile Design
▪ Penetration Mechanics	▪ Train-Railway Crashworthiness	▪ Industrial Design for Ergonomics &Trauma
▪ Terminal Ballistics	▪ Blast-Explosion Protection	▪ Automated & Connected Vehicles
▪ Ductility-Metal Forming	▪ Earthquake-Storm-Disaster Protection	▪ High Speed Stereoscopic Photography
▪ Plastics/Ceramics	▪ Intelligent Transportation Systems	▪ Digital Image Processing & Correlation
▪ Biomechanics	▪ Transportation of Dangerous Goods; ADR, IMDG, RID, ICAO	▪ Optical Metrology-Inverse Engineering
▪ Composite-Hybrid Materials	▪ Accident Reconstruction	▪ Digital Photogrammetry
▪ Multi-Body Dynamics	▪ Survivability-Vulnerability-Lethality	▪ Engineering Education
▪ Isogeometric Analysis	▪ Forensic Analysis	▪ Digital Human Body Modeling
▪ Multi-Scale Modeling	▪ Threat and Risk Assessment	▪ Modeling Anthropomorphic Test Devices
▪ High Performance Computing	▪ Certification by Analysis [3]	▪ Structural Health Monitoring
▪ Quantum Computing		▪ Open-Source Initiative
▪ Computational Materials Science		▪ Computing Methods in Engineering
▪ Computational Nanomaterials		▪ Mathematics for Engineers

4. Academic & Industrial Experience:

Position	Affiliation	Period
Lecturer	Middle East Technical University (METU) www.metu.edu.tr Department of Engineering Sciences	2022-
Researcher	Sabancı University www.sabanciuniv.edu Nanotechnology Research and Application Center (SUNUM) https://sunum.sabanciuniv.edu/	2021-
Faculty ***Assist. Prof. Dr.***	Sabancı University www.sabanciuniv.edu Integrated Manufacturing Technologies Research and Application Center (SU-IMC) Composite Technologies Center of Excellence https://suimc.sabanciuniv.edu/	2017-2021
General Manager, Founder	Infinitdynamics Ltd. Şti. www.infinitdynamics.com	2016-
Chief Engineer of Design and Research	TAI - Turkish Aerospace Industries Inc. Indigenous Helicopter Project - GÖKBEY www.tai.com.tr	2015-2016
Project Coordinator	Turkish Standards Institute Automotive Testing Center Project Transportation and Logistics Systems Center www.tse.org.tr	2014-2015
Visiting Professor	Near East University Department of Automotive Engineering www.neu.edu.tr	2015-2017
Visiting Professor	Bahçeşehir University, Department of Transportation www.bahcesehir.edu.tr	2013-2014
Post-Doctoral Research Associate	National Crash Analysis Center The George Washington University www.ncac.gwu.edu	2013-2014
Research Fellow	National Crash Analysis Center The George Washington University www.gwu.edu	2003-2013
Research Assistant	Department of Design & Manufacturing Engineering Gebze Technical University www.gtu.edu.tr	2000-2003
R&D Engineer	Research & Innovation Labs. Canovate Group, Electronics Inc., (ex-Alcatel, Turkey) http://www.canovate.com	1999-2000

5. Honors & Awards:

- Alex Charters Student Scholar, Hypervelocity Impact Society (HVIS), 2007
- Graduate Student Scholarship, National Science Foundation (NSF), 2005, 2007
- Graduate Student Scholarship, Federal Aviation Administration (FAA), 2005
- Support for Attending Scientific Activities, George Washington University, 2004, 2005, 2007, 2008, 2010
- Research Fellowship, George Washington University, National Crash Analysis Center (NCAC), 2003 - 2012
- Graduate Student Scholarship, Scientific and Technological Research Council of Turkey (TUBITAK), 2003
- Research Assistantship, Gebze Institute of Technology, 2000 - 2003
- Scholarship for Research Projects Contest and Science Fair, TUBITAK, 1994

6. Teaching Experience:

Institution	Code and Name of the Course	Hours/Week	Academic Year	Term
METU	Mathematics for Engineers (*ES 202*)	3	2023-2024	Fall
METU	Mathematics for Engineers (*ES 202*)	3	2022-2023	Spring
METU	Computing Methods in Engineering (*ES 361*)	3	2022-2023	Spring
METU	Mathematics for Engineers (*ES 202*)	3	2022-2023	Fall
METU	Computing Methods in Engineering (*ES 361*)	3	2022-2023	Fall
METU	Mathematics for Engineers (*ES 202*)	3	2021-2022	Spring
METU	Computing Methods in Engineering (*ES 361*)	3	2021-2022	Spring
SU	*Mechanical Behavior of Materials (*MAT 505*)	3	2018-2019	Spring
NEU	Vehicle Dynamics (*AUE401*)	3	2017-2018	Fall
NEU	Vehicle Component Design (*AUE306*)	3	2017-2018	Fall
NEU	Vehicle Body Design (*AUE403*)	3	2017-2018	Fall
YU	Traffic and Road Safety (*ULM307*)	3	2016-2017	Fall
NU	Computational Applications in Civil Engineering (*INS407*)	3	2016-2017	Fall
NU	Transportation 2 (*INS307*)	3	2016-2017	Fall
NU	Introduction to Civil Engineering (*YCVL113*)	3	2016-2017	Fall
IGU	Strength of Materials I (INS205)	3	2016-2017	Summer
IGU	Strength of Materials II (INS204)	3	2016-2017	Summer
IGU	Structural Analysis I (INS215)	3	2016-2017	Summer
IGU	Structural Analysis II (INS216)	3	2016-2017	Summer
NEU	Vehicle Body Design (AUE403)	3	2016-2017	Spring
NEU	Vehicle Component Design (AUE306)	3	2016-2017	Spring
NEU	Fuel Cells (AUE421)	3	2016-2017	Spring
NEU	Internal Combustion Engine (*ME421*)	3	2016-2017	Fall
NEU	Vehicle Dynamics (*AUE401*)	3	2016-2017	Fall
NEU	Vehicle Body Design (*AUE403*)	3	2016-2017	Fall
NEU	Vehicle Production Processes and Systems (*AUE404*)	3	2015-2016	Spring
NEU	Vehicle Body Design (*AUE403*)	3	2015-2016	Spring
NEU	Vehicle Component Design (*AUE306*)	3	2015-2016	Spring
NEU	Vehicle Production Processes and Systems (*AUE404*)	3	2015-2016	Fall
NEU	Vehicle Body Design (*AUE403*)	3	2015-2016	Fall
NEU	Vehicle Component Design (*AUE306*)	3	2015-2016	Fall
NEU	Vehicle Dynamics (*AUE401*)	3	2014-2015	Summer
NEU	Introduction to Automotive Engineering (*AUE305*)	3	2014-2015	Spring
NEU	Vehicle Component Design (*AUE306*)	3	2014-2015	Spring
NEU	Vehicle Dynamics (*AUE401*)	3	2014-2015	Spring
BAU	*Roadside Hardware Design (*KSU5416*)	4	2013-2014	Fall
GWU	Structural Theory - I (*CE121*)	2	2007-2008	Fall
GWU	*Non-linear Finite Element Modeling and Simulation (*CE264*)	2	2006-2007	Spring
GWU	*Non-linear Finite Element Modeling and Simulation (*CE264*)	2	2005-2006	Spring
GTU	*Fundamentals of Finite Element Analysis (FEA) (*MAK520*)	3	2002-2003	Spring
GTU	*Computer Aided Design (*MAK521*)	3	2002-2003	Fall
GTU	*Fundamentals of Finite Element Analysis (FEA) (*MAK520*)	3	2001-2002	Spring
GTU	*Computer Aided Design (*MAK521*)	3	2001-2002	Fall

METU: Middle East Technical University, SU: Sabanci University, BAU: Bahçeşehir University, GTU: Gebze Technical University, GWU: The George Washington University, IGU: Istanbul Gelişim University, NEU: Near East University, NU: Nişantaşı University, YU: Yalova University

* Offered for graduate level.

7. Graduated Students:

▪ Mr. Fatih Uzun, M.Sc., *Sabancı University*, Istanbul, 2020.

- Multidisciplinary investigation of c-type composite sandwich radome panels within the scope of acoustic emission based damage characterization and electromagnetic transmission performance. M.Sc. Thesis, 2020.

[**Link**]

▪ Mr. Deha Ünal, M.Sc., *Sabancı University*, Istanbul, 2020.

- Development of in-situ thermal monitoring system for selective laser sintering to evaluate nesting design. M.Sc. Thesis, 2020.

[**Link**]

8. Mentoring Experience:

▪ Mr. Peter Azor Okorugbo, B.Sc., Graduation Thesis, *Near East University*, Cyprus, 2016.

- Research Topic: The turbocharger.

▪ Mr. Hamad Ayman Yousef and Mr. Alaa Almasalmah, B.Sc., Graduation Thesis, *Near East University*, Cyprus, 2016.

- Research Topic: Concept car design.

▪ Mr. Kemal Şişmanoğlu, B.Sc., Graduation Thesis, Near East University, Cyprus, 2016.

- Research Topic: Electric vehicle design.

▪ Mr. Stefano Dolci, M.Sc., Visiting Research Scholar, *Politecnico di Milano*, Italy, 2012.

- Research Topic: Crash of Pick-up suspension: incorporating suspension failure in a vehicle finite element model to improve simulations of roadside hardware impacts.

▪ Mr. Thomas M. Fesich, M.Sc., Exchange Student, *Universität Stuttgart*, Germany, 2008.

- Research Topic: A study of the Gurson damage model and numerical simulation of failure.

▪ Ms. Carina Loeffler, M.Sc., Exchange Student, *Universität Stuttgart*, Germany, 2006.

- Research Topic: Development of a numerical model for Split Hopkinson Bar (SHB) testing.

▪ Mr. Björn Petersen, M.Sc., Exchange Student, *Universität Stuttgart*, Germany, 2006.

- Research Topic: Development of a numerical model for oxi-hydrogen detonation in pipes.

▪ Mr. Michael Dietenberger, M.Sc., Exchange Student, *Universität Stuttgart*, Germany, 2005.

- Research Topic: Development of a high stain-rate dependent vehicle model.

▪ Mr. Thomas Kernstock, M.Sc., Exchange Student, *Universität Stuttgart*, Germany, 2005.

- Research Topic: An inverse approach to identify the constitutive model parameters of aluminum honeycombs.

▪ Dr. Ali Durmus, Ph.D., Visiting Post-Doctoral Research Scholar, *Uludağ Üniversitesi*, Turkey, 2005.

- Research Topic: Comparison of the NCHRP Report-350 guidelines with the European equivalent EN-1317 standard; special case for applications in Turkey.

9. Research Experience & Selected Research and Supported Projects:

9.17.	***Affiliation***	: Sabancı University
	Position	: Advisor
	Project Title	: Eş Zamanlı Yapısal Davranış İzleme ve Uyarı Sistemi (Concurrent Structural Health Monitoring and Warning System)
	Period	: 2020-2021
	Funding Agency	: TÜBİTAK-1511: TEYDEB
9.16.	***Affiliation***	: Sabancı University
	Position	: PI
	Project Title	: Sonlu Elemanlar Analizi ile Polimer Matris Kompozit Yaprak Yay Tasarımı Projesi (Polymer Matrix Composite Leaf Spring Design Project with Finite Element Analysis)
	Period	: 2020-2021
	Funding Agency	: FORD Otosan A.Ş.
9.15.	***Affiliation***	: Sabancı University
	Position	: Advisor
	Project Title	: National Integrated Tactical Wheeled Vehicle
	Period	: 20.02.2018 - 20.02.2021
	Funding Agency	: TÜBİTAK-1501: TEYDEB

9.14. ***Affiliation*** : Sabancı University
Position : Researcher
Project Title : Hafif Zırh Uygulamaları için Alümina Seramiğinin Oksit Seramik ve Metal Faz Katkısıyla Üretilmesi ve Karakterizasyonu
(Production and Characterization of Alumina Ceramic with Oxide Ceramic and Metal Phase Additives for Light Armor Applications)
Period : 15.11.2018 - 15.11.2019
Funding Agency : TÜBİTAK-1002: 118M806

9.13. ***Affiliation*** : Sabancı University
Position : Advisor
Project Title : Kristal Plastisite Sonlu Eleman Metodu Kullanılarak Plastik Deformasyon Sonrası Oluşan Kalıntı Gerilimlerin Hesaplanması için Nümerik Yöntem Geliştirilmesi ve Otomotiv Uygulaması
(Developing a Numerical Method for Calculating Residual Stress After Plastic Deformation Using Finite Element Method of Crystal Plasticity and Automotive Application)
Period : 01.11.2018 - 2021
Funding Agency : TÜBITAK-1001: 118M285

9.12. ***Affiliation*** : Sabancı University
Position : Advisor
Project Title : Farklı İstifleme Dizilerine ve Karbon Elyaf Tiplerine Sahip Fiber Takviyeli Polimerlerin Yük Altındaki Mikro-Hasar Oluşumunun/Birikiminin Hibrit Yöntemler Kullanarak İzlenmesi
(Monitoring of Micro-Damage Initiation/Accumulation Under Load Using Hybrid Methods of Fiber Reinforced Polymers with Different Stacking Arrays and Carbon Fiber Types)
Period : 01.09.2018 - 2021
Funding Agency : TÜBİTAK-1001: 217M211

9.11. ***Affiliation*** : Sabancı University
Position : Advisor
Project Title : Çelik Gövde Bağlantı Parçasının Tasarımı Eniyileştirilerek Yenilikçi İmalat Teknikleri Sonucunda Elde Edilecek Termoplastik Karbon Kompozitlerin (TFP) Kullanılması İle Hafifleştirilmesi
(Lightening the Steel Body Connector by Optimizing the Design and Using Thermoplastic Carbon Composites (TFP) to be Obtained as a result of Innovative Manufacturing Techniques)
Period : 01.10.2018 - 2021
Funding Agency : TÜBİTAK-1511: TEYDEB 1180152

9.10. ***Affiliation*** : Sabancı University
Position : PI
Project Title : Darbe Sönümlendirici Bariyer Test, Analiz ve Tasarımı
(Test, Analysis and Design of Impact Damping Barrier)
Period : 20.02.2018 - 31.07.2019
Funding Agency : İGDAŞ: E.D.KM-18-01812

9.9. ***Affiliation*** : Sabancı University
Position : PI
Project Title : Kompozit Malzeme Teknolojileri ile Üretilecek Parçaların Doğrulanmış Sonlu Elemanlar Analizlerini Gerçekleştirmek Üzere Temel Yöntem ve Yaklaşımların Belirlenmesi
(Determination of Fundamental Methods and Approaches to Perform Validated Finite Element Analysis of Parts to be Produced with Composite Material Technologies)
Period : 03.09.2018 - 07.07.2019
Funding Agency : BORUSAN: E.A.KM-18-01869

9.8. ***Affiliation*** : Infinitdynamics Ltd. Şti.
Position : Advisor
Project Title : Lightweight Design, Analysis, Optimization, and Certification by Analysis of Aviation Seats
Period : 01.04.2014 - 01.04.2016
Funding Agency : TÜBITAK-1507: TEYDEB
Collaboration : Turkish Seat Industries (TSI)

9.7. ***Affiliation*** : Sabancı University
Position : Researcher
Project Title : Otokorkuluk Dikmelerinin Performansına Zemin Özelliklerinin Etkisinin Arazi Deneyleri ve Sayısal Analizler Kullanılarak İncelenmesi

(Investigation of the Effect of Soil Properties on the Performance of Guardrail Posts Using Field Tests and Numerical Analysis)
Period : 01.04.2014 - 01.04.2016
Funding Agency : TÜBİTAK-1001: 213M516
Collaboration : Directorate of Highways (KGM)

9.6. Affiliation : National Crash Analysis Center, The George Washington University www.ncac.gwu.edu
Position : Lead Research Fellow (November 2004 – 2013), Lead Research Associate (since 2013)
Project Title : Explicit Finite Element Analysis (FEA) of Uncontained Aircraft Engine Failure
Period : November 2004 – 2013
Funding Agency : Federal Aviation Administration (FAA) Aircraft Catastrophic Failure Prevention Program U.S. Department of Transportation (DOT)

9.5. Affiliation : National Crash Analysis Center, The George Washington University www.ncac.gwu.edu
Position : Research Fellow
Project Title : Development of Guidance for the Selection, Use, and Maintenance of Cable Barrier Systems
Project Activity : April 2008 - December 2011
Funding Agency : Transportation Research Board (TRB), National Academy of Sciences The National Cooperative Highway Research Program (NCHRP), NCHRP Project 22-25

9.4. Affiliation : National Crash Analysis Center, The George Washington University www.ncac.gwu.edu
Position : Research Fellow
Project Title : Development and Improvement of Anti-ram Devices for the Protection of U.S. Physical Assets, Buildings in Washington D.C. and Abroad
Project Activity : September 2005 - September 2008
Funding Agency : U.S. Department of State (DOS)

9.3. Affiliation : National Crash Analysis Center, The George Washington University www.ncac.gwu.edu
Position : Research Fellow
Project Title : Cooperative Agreement Between FHWA / National Highway Traffic Safety Administration (NHTSA) and NCAC on Highway, Infrastructure and Occupant Safety Research
Project Activity : September 2003 - April 2008
Funding Agency : FHWA/ NHTSA, U.S. DOT

9.2. Affiliation : National Crash Analysis Center, The George Washington University www.ncac.gwu.edu
Position : Research Fellow
Project Title : Crashworthiness and Sensitivity Analysis of Structural Composite Inserts in Vehicle Structure for Lightweight Vehicle Design
Project Activity : September 2010 - September 2011
Funding Agency : National Center for Manufacturing Sciences (NCMS), U.S. Department of Energy, Office of Freedom Car and Vehicle Technologies

9.1. Affiliation : Department of Design & Manufacturing Engineering, Gebze Technical University, www.gtu.edu.tr
Position : Research Assistant
Project Title : Design Optimization of GT-Model Vehicle under Impact Loading
Project Activity : September 2000 - May 2003
Funding Agency : Gebze Technical University

10. Continuing Education & Certificate Programs:

Certificate Program	Organization	Year
▪ Aviation Safety and Security Program	The George Washington University, Aviation Institute & The International Air Transport Association (IATA)	2008
▪ Modeling of Blast & Penetration: Applications to Protective Structures, Vehicles and Homeland Security Threats	Livermore Software Technology Corporation (LSTC)	2008
▪ Uncontained Engine Debris Damage Assessment Model (UEDDAM) Training	NAVAIR, NAWCWD	2006
▪ Material Modeling Using USERMAT	LSTC	2006
▪ ALE/Eulerian & Fluid/Structure Interaction	LSTC	2006
▪ Aircraft Accident Investigation	National Transportation Safety Board (NTSB)	2004
▪ Advanced Training in Impact Analysis	LSTC	2004

11. Academic, Professional and Community Services & Activities:

Thesis Committee Member

- Bekir Sıdık Köylü, Otomotiv Sektöründe Muayene Ve Kontrol Uygulamaları Yapılabilirlik Analizi, *Afyon Kocatepe Üniversitesi, Fen Bilimleri Enstitüsü, M.Sc. Thesis*, 2022.
- Fatih Uzun, Multidisciplinary Investigation of C-Type Composite Sandwich Radome Panels within The Scope of Acoustic Emission Based Damage Characterization and Electromagnetic Transmission Performance, *Sabanci University, M.Sc. Thesis*, 2020.
- Deha Ünal, Development of In-Situ Thermal Monitoring System for Selective Laser Sintering to Evaluate Nesting Design, *Sabanci University, M.Sc. Thesis*, 2020.
- Mehmet Onur Öztepe, Estetik, Hafif ve Yeni Nesil Ağır Hizmet Tipi Çelik Köprü Otokorkuluk Sistemi Geliştirilmesi, *İstanbul Teknik Üniversitesi, Fen Bilimleri Enstitüsü, M.Sc. Thesis*, 2020.
- Betül Kafkaslıoğlu Yıldız, Zırh Uygulamaları İçin Alümina Seramiklerin Sert Seramik Katkılar ve Metal Faz İle Takviyelendirilerek Üretilmesi ve Karakterizasyonu, *Gebze Teknik Üniversitesi, Fen Bilimleri Enstitüsü, PhD. Dissertation*, 2019.
- Güney Görgün, Uçak Koltuğu Sırtlık Sisteminin Karbon Fiber Kompozitten Modellenmesi ve SAE 5526D Standardına Göre Sonlu Elemanlar Analizi, *İstanbul Teknik Üniversitesi, Fen Bilimleri Enstitüsü, M.Sc. Thesis*, 2019.
- Mustafa Yurdabal Apak, Şehir İçi Yol Kenarı Sabit Tesisler İçin Trafik Kazalarına Karşı Koruyucu ve Önleyici Otokorkuluk Geliştirilmesi, *İstanbul Teknik Üniversitesi, Fen Bilimleri Enstitüsü, PhD. Dissertation*, 2019.
- İlker Dursun, Cam Elyaf Takviyeli Polimerlerin Değişik Sıcaklıklarda Mekanik Özellikleri, *Gebze Teknik Üniversitesi, Fen Bilimleri Enstitüsü, M.Sc. Thesis*, 2018.
- Fethi Yürür, Çarpma Yastıkları ve D-100 Karayolu Avcılar – Pendik Aksının İncelenmesi, *İstanbul Teknik Üniversitesi, Fen Bilimleri Enstitüsü, M.Sc. Thesis*, 2018.
- Tuğçe Kiper, Hava Araçlarında Kuş Çarpmasının Etkilerinin Analizi, *Gazi University, School of Applied Science, M.Sc. Thesis*, 2015.
- Enes Çetin, Ağrı - Eleşkirt Arası Karayolu Güvenliğinin İncelenmesi ve Çözüm Önerilerinin Sunulması, *Bahçeşehir University, School of Applied Science, M.Sc. Thesis*, 2014.

Reviewer

- International Journal of Impact Engineering
- International Journal of Crashworthiness
- Computational Materials Science
- Accident Analysis & Prevention

Co-organizer

- Minisymposium on Application of Mesh-free Methods: Solving Practical Problems, with Dr. C.T. Wu (LSTC), The 10th U.S. National Congress on Computational Mechanics, Columbus, OH, 2009.
- Minisymposium on Advances and Applications of Mesh-free and Extended Finite Element Methods, with Dr. C.T. Wu (LSTC), 9th U.S. National Congress on Computational Mechanics, San Francisco, CA, 2007.

Conference reviewer

- International Crashworthiness Conference
- U.S. National Congress on Computational Mechanics

Committee member - observer

- W29 - World Forum for Harmonization of Vehicle Regulations\ Working Party on Passive Safety (GRSP)
- AFB20 (1) - Roadside Safety Design Subcommittee on Computational Mechanics, Transportation Research Board (TRB)
- AFB20 (2) - Roadside Safety Design Subcommittee on International Research, Transportation Research Board

Referee

- Annual Loudoun County Science & Engineering Fair, Regional Competition among High Schools, Virginia.

12. Membership to Scientific and Professional Organizations:

- American Institute of Aeronautics and Astronautics (AIAA)
- American Society of Civil Engineers (ASCE)
- American Society of Mechanical Engineers (ASME)
- Hypervelocity Impact Society (HVIS)
- Mechanical Design and Production Society (MATIM)
- Society of Automotive Engineers (SAE)
- Union of Chambers of Turkish Engineers and Architects (TMMOB)

13. Special Skills & Computer Literacy‡:

Languages	: Turkish (Native), English (Fluent) [YÖKDİL – 95 @ 09.09.2022]
Programming languages	: Fortran, C/C++, Python
Scientific computing	: *Matlab, Mathematica, Comsol Multi-Physics, SciLab, LabVIEW
Operating systems	: MSWindows, Unix, Linux
FEA, Numerical solvers	: *ANSYS, *LS-DYNA, OpenRadioss, ABAQUS, Moldflow, Fluent
FEA, Pre/post processors	: *HyperWorks, *LS-PrePost, Patran, ANSA, ParaView
CAD/CAM/CAE	: *Pro/Engineer-Wildfire-Creo, *Catia, *SolidWorks, *AutoCAD, Siemens NX
Digital image processing	: Aramis, PolyWorks, Geomagic, Materialise-Mimics
Multi-body dynamics	: MADYMO, HVE, CarSim
Optimization	: *LS-OPT, iSIGHT, LS-TaSC, Optistruct, modeFRONTIER, Genesis
Data analysis	: SAS, SPSS
Creative design	: Adobe Creative, 3ds Max, Maya, Rhinoceros, GIMP
Office software	: *MSOffice, OpenOffice, LateX, LibreOffice, Endnote
Laboratory equipment	: Instron and MTS Uni-axial - Bi-axial - Uni-axial Torsion Loading Frames, Tension-Compression-Torsion Split Hopkinson Bar (SHB) Apparatus

*Have teaching experience.

14. Citations:

For citation information : [**Link-Google Scholar**]

15. Publications:

15.1. Papers published in the refereed international journals (SCI, SCI-Expanded, EI)

Demir, O., Uslan, I., **Buyuk, M.**, Salamci, M. U., Development and Validation of a Digital Twin of The Human Lower Jaw Under Impact Loading by Using Non-Linear Finite Element Analyses. *Journal of the Mechanical Behavior of Biomedical Materials*, December (**2023**), Vol. 148, 106207.

[**doi**] Q2 (WoS ClarivateCJR) – Q2 (Scopus SJR)

Apak, M. Y., Ergun, M., Ozen, H., **Buyuk, M.**, Yumrutas, H. I., Ozcanan, S., Atahan, A. O., A Novel Modular Shallow Mounted Bollard System Design and Finite Element Performance Analysis in Ensuring Urban Roadside Safety. *Proceedings of The Institution of Mechanical Engineers Part D-Journal of Automobile Engineering*, August (**2022**),1–19.

[**doi**] Q3 (WoS ClarivateCJR) – Q2 (Scopus SJR)

Seidt, J., Park, C.-K., **Buyuk, M.**, Lowe, R., Wang, L., Carney, K. S., DuBois, P., Gilat, A., Kan, C.-D., An Experimental Investigation of the Influence of the State of Stress on the Ductile Fracture of 2024-T351 Aluminum, *Journal of Engineering Materials and Technology - Transactions of the ASME*, October (**2022**), Vol. 144, 041006-1-13.

[**doi**] Q4 (WoS ClarivateCJR) – Q2 (Scopus SJR)

Apak, M. Y., Ergun, M., Ozen, H., **Buyuk, M.**, Ozcanan, S., Atahan, A. O., Yumrutas, H. I., Finite Element Simulation and Failure Analysis of Fixed Bollard System According to the PAS 68:2013 Standard. *Engineering Failure Analysis*, May (**2022**), Vol. 135, 106151.

[**doi**] Q1 (WoS ClarivateCJR) – Q1 (Scopus SJR)

Yıldız, B. K., **Büyük, M.**, Tür, Y. K. Low Velocity Drop Weight Impact Behaviour of Al_2O_3-Ni-ZrO_2 and Al_2O_3-Ni-Cr_2O_3 Ceramic Composites. *Processing and Application of Ceramics*, 15 (2), (**2021**), 154–163.

[**doi**] Q3 (WoS ClarivateCJR) – Q3 (Scopus SJR)

Örnek, M., Atahan, A. O., Türedi, Y., Erdem M. M. and **Büyük M**. Soil Based Design of Highway Guardrail Post Depths Using Pendulum Impact Tests. *Acta Geotechnica Slovenica*, 2019/2, (**2019**), 77-89.

[**doi**] Q4 (WoS ClarivateCJR) – Q4 (Scopus SJR)

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15.2. Papers submitted to be published in the refereed international journals (SCI, SCI-Expanded)

5) **Buyuk, M.**, Uzun, F., Yıldız, M. Multidisciplinary Investigation of C-Type Composite Sandwich Radome Panels within the Scope of Acoustic Emission-Based Damage Characterization and Electromagnetic Transmission Performance. *Submitted to the Composites Part A: Applied Science and Manufacturing.*

4) **Buyuk, M.**, Deha, Ü. Development of In-Situ Thermal Monitoring System for Selective Laser Sintering to Evaluate Nesting Design. *Submitted to the Materials & Design*.

3) **Buyuk, M.** The Effects of State-of-Stress on Vehicle Crashworthiness. *Submitted to the International Journal of Crashworthiness*.

2) **Buyuk, M.** Evaluating the Failure Characteristics of Al2024-T351 Based on Multiple States-of-Stress. *Submitted to the Journal of Aerospace Engineering*.

1) **Buyuk, M.**, The Effects of Stress Triaxiality on the Manufacturability Evaluation of Aluminum Sheet Metals During Progressive Metal Stamping. *Submitted to the Journal of Manufacturing Engineering*.

15.3. Papers with oral presentation at refereed international conferences and published in the proceedings

23) Yilmaz, C., Akalin, C., Gunal, I., Celik, H., **Buyuk, M.**, Suleman, A., and Yildiz, M. Observation of Damage Accumulation under In-plane Shear Loading. *NATO S&T specialist's workshop (AVT-305), Sensing Systems for Integrated Vehicle Health Management for Military Vehicles, Sensing Systems for Integrated Vehicle Health Management for Military Vehicles*, 15 December 2018, Athens, Greece.

22) Aydin, Ö. F., Malkoç, G., **Büyük, M**., Diez, J. and Atahan, A. O. Safety of Road Work Zones: European and the U.S. Perspective. *E&E Congress 2016, 6th Eurasphalt & Eurobitume Congress*, 1-3 June 2016, Prague, Czech Republic.

21) **Buyuk, M.**, Marzougui, D., and Kan, C. D. Safety Performance Evaluation of Portable Concrete Barriers with Different Design Combinations by using Modular Finite Element Modeling Approach. *International Crashworthiness Conference*, 22-25 July 2008, Kyoto, Japan.

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19) **Buyuk, M.**, Kan, C. D., and Loikkanen, M. J. Explicit Finite Element Analysis of 2024-T3/T351 Aluminum Material under Impact Loading for Airplane Engine Containment and Fragment Shielding. *Earth & Space 2008, ASCE 11th Aerospace Division International Conference on Engineering, Construction and Operations in Challenging Environments*, 3-5 March 2008, Long Beach, CA.

18) **Buyuk, M.**, Kurtaran, H., Marzougui, D., and Kan, C. D. A Multi-Objective Discrete Design Optimization Algorithm for Portable Concrete Barriers by Coupling Grey Relational Analysis with Successive Taguchi Method. *TRB 87th Annual Meeting*, 13-17 January 2008, Washington, D.C.

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15) **Buyuk, M.**, Demircan, D. O., Morgan, R. M., Digges, K. H., and Smith, B. Using Forefoot Acceleration to Predict Forefoot Trauma in Frontal Crashes. *SAE 2007 World Congress*, 16-19 April 2007, Cobo Center, Detroit, Michigan.

14) Dietenberger, M., **Buyuk, M.**, and Kan, C. D. Development of a High Stain-Rate Dependent Vehicle Model. *4th German LS-DYNA Forum*, 20-21 Oct 2005, Bamberg, Germany.

13) **Buyuk, M.**, Kildare, S., Kan, C. D., and Marzougui, D. Moving Beyond the Finite Elements: A Comparison Between Finite Element Methods and Meshless Methods for Modeling Honeycomb Materials and Simulating Side Impact Moving Deformable Barriers (MDBs). *5th European LS-DYNA Conference*, 25-26 May 2005, Birmingham, UK.

12) Loikkanen, M. J., **Buyuk, M.**, Kan, C. D., and Meng, N. A Computational and Experimental Analysis of Ballistic Impact to Sheet Metal Aircraft Structures. *5th European LS-DYNA Conference*, 25-26 May 2005, Birmingham, UK.

11) **Buyuk, M.**, Kurtaran, H., Kan, C. D., and Marzougui, D. Approximate Optimization Method as an Efficient Design Methodology for Armors under Ballistic Impacts. *1st AIAA Multidisciplinary Design Optimization Specialist Conference*, 18-21 Apr 2005, Austin, Texas.

10) Durmus, A., **Buyuk, M.**, Musayev, E., Ulku, S., Kan, C. D., and Marzougui, D. Determination of the Ballistic Performance of a Cold-Rolled, Deep-Drawing Sheet Metal. *46th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics & Materials Conference*, 18-21 Apr 2005, Austin, Texas.

9) **Buyuk, M.**, Kurtaran, H., and Bedewi, N. E. Prediction of Bend Allowance in Air-Bending of Sheet Metals Using Artificial Neural Network. *3rd International Conference and Exhibition on Design and Manufacturing of Dies and Molds*, 17-19 June 2004, Bursa, Turkey.

8) **Buyuk, M.**, Kan, C. D., Bedewi, N. E., Durmus, A., and Ulku, S. Moving Beyond the Finite Elements: A Comparison Between Finite Element Methods and a Meshless Method for a Ballistic Impact Simulation. *8th International LS-DYNA Conference*, 3-4 May 2004, Detroit, Michigan.

7) Turkmen, H. S., Eren, E., and **Buyuk, M.** Dynamic Behaviour of a Laminated Balsa Beam under Impulsive Load. *Earth & Space 2004, ASCE 9th Aerospace Division International Conference on Eng., Construction and Operations in Challenging Environments*, 7-10 March 2004, League City-Houston, Texas.

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5) **Buyuk, M.**, Kurtaran, H., Turkmen, H. S. The Effect of Material Model Selection on Ballistic Impact Simulations. *9th International Conference on the Mechanical Behavior of Materials*, 25-29 May 2003, Geneva, Switzerland.

4) **Buyuk, M.**, Kurtaran, H., Turkmen, H. S., and Mecitoglu, Z. Influence of Damping on the Response of a Beam-to-Plate Connection under Mass Drop. *9th International Conference on The Mechanical Behavior of Materials*, 25-29 May 2003, Geneva, Switzerland.

3) Kurtaran, H., and **Buyuk, M.** Behavior of a Refinery Tank Containing Oil under Weight Loading. *GAP 2002 4th Engineering Congress*, 6-8 June 2002, Sanliurfa, Turkey.

2) Ozcelik, B., and **Buyuk, M.** An Experimental Approach for Determining the Bend Allowance in Air-Bending Process. *2nd International Conference and Exhibition on Design and Manufacturing of Dies and Molds*, 2001, Kusadasi-Izmir, Turkey.

1) Ozcelik, B., Erzurumlu, T., and **Buyuk, M.** Finite Elements Analysis and Application Work for a Plastic Injected Experimental Part. *International Symposium on Intelligent Manufacturing Systems*, 2001, Kocaeli, Turkey.

15.4. Technical reports & white papers

8) Savunma Sanayi Başkanlığı, Kompozit Teknolojileri Yol Haritası, 2019. (in Turkish)

(Presidency of Defense Industry, Composite Technologies Roadmap)

7) **Buyuk, M.**, Development of a New Metal Material Model in LS-DYNA, PART 2: Development of a Tabulated Thermo-Viscoplastic Material Model with Regularized Failure for Dynamic Ductile Failure Prediction of Structures under Impact Loading. *Federal Aviation Administration*, July 2014. Report Number: DOT/FAA/TC-13/25, P2.

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5) **Buyuk, M.,** Marzougui, D., Kan, S., and Kurtaran, H. A Multi-Objective Discrete Design Optimization Algorithm for Portable Concrete Barriers by Coupling Grey Relational Analysis with Successive Taguchi Method. *FHWA/NHTSA National Crash Analysis Center, The George Washington University*, June 2008. Report Number: NCAC 2007-W-005.

4) **Buyuk, M.** Explicit Finite Element Analysis of 2024-T3/T351 Aluminum Material under Impact Loading for Airplane Engine Containment and Fragment Shielding. *Aviation Institute, The George Washington* University, Aviation Safety and Security Certificate Program, May 2008.

3) Marzougui, D., **Buyuk, M.**, Kan, S., and Opiela, K. S. Safety Performance Evaluation for Combinations of Portable Concrete Barrier Elements. *FHWA/NHTSA National Crash Analysis Center, The George Washington University*, August 2007. Report Number: NCAC 2007-W-004.

2) Marzougui, D., **Buyuk, M.**, and Kan, S. Performance Evaluation of the Portable Concrete Barriers. *FHWA/NHTSA National Crash Analysis Center, The George Washington University*, January 2007. Report Number: NCAC 2007-R-004.

1) **Buyuk, M.**, Kan, C. D. Multi-Scale Finite Element Modeling of Woven-Fabric Composite Materials under Impact Loading. *FHWA/NHTSA National Crash Analysis Center, The George Washington University*, October 2006.

15.5. Papers with oral presentation at refereed regional conferences and published in the proceedings (in Turkish)

10) Erdem, M.M., **Büyük, M.**, Bikçe, M. Düzlem İçi Yanal Yük Altındaki Tek Katlı ve Tek Açıklıklı Bir Çerçevenin Ls-Dyna İle Simülasyon Çalışması. *4. Uluslararası Deprem Mühendisliği ve Sismoloji Konferansı Bildiri Kitabı*, 11-13 Ekim 2017, Anadolu Üniversitesi – Eskişehir.

(Simulation Study of a One Bay – One Story Reinforced Concrete Frame Under In-Plane Lateral Load)

9) Atahan, A. O., **Büyük, M**., Çağli, S., and Bayraktar, M.E. CE Standartlarına Uygun Yerli Beton Bariyer Tasarımı, Analizi ve Çarpışma Testi Yapılması. *TRANSİST 2017 Bildiri Kitabı*, 2 - 4 Kasım 2017, İstanbul.

(Domestic Concrete Barrier Design, Analysis and Crash Test in Accordance with CE Standards)

8) **Büyük, M.** Kaza İnceleme Kurul Yapıları. *Havacılık Emniyeti Yönetim Sistemi (HEYS) 2017 Sempozyumu*, 12-13 Nisan 2017, Ankara.

(Accident Investigation Board Structures)

7) Yalçın, E. G., **Büyük, M.** Bir Akıllı Ulaşım Öğesi Olarak Otomatik Kaza Bildirim Sistemlerinin Trafik Çarpışmalarının Sonuçları Üzerindeki Yeri ve Önemi. *1. Karayolu Akıllı Ulaşım Sistemleri Kongre ve Sergisi*, 26-28 Mayıs 2014, İstanbul.

(The Role and Importance of Automatic Accident Notification Systems as an Intelligent Transportation Element on the Consequences of Traffic Collisions)

6) Durmuş, A., **Büyük, M.** Gülçimen, B., ve Ülkü, S. Taşıt-Bariyer Çarpışma Simülasyonunun Fiziksel Test Sonuçları ile Karşılaştırılması. *OTEKON'06 Otomotiv Teknolojileri Kongresi*, 26-28 Haziran 2006, Bursa.

(Comparison of Vehicle-Barrier Collision Simulation with Physical Test Results)

5) Kurtaran, H., **Büyük, M.** ve Bedewi, N. E. Chevrolet C2500 Pikap Aracın Mayın Patlaması Altındaki Dinamik Davranışının Bilgisayar Ortamında Simülasyonu. *SAVTEK Savunma Teknolojileri Kongresi*, 24-25 Haziran 2004, ODTÜ, Ankara.

(Computerized Simulation of Chevrolet C2500 Pickup Vehicle's Dynamic Behavior under Mine Explosion)

4) Durmuş, A., **Büyük, M.**, Ülkü, S., Musayev, E. ve Bedewi, N. E. Bakır Folyalarda Balistik Perforasyon. *SAVTEK Savunma Teknolojileri Kongresi*, 24-25 Haziran 2004, ODTÜ, Ankara.

(Ballistic Perforation on Copper Foils)

3) Durmuş, A., **Büyük, M.**, Musayev, E. ve Ülkü, S. Soğuk Şekillendirme Sacının Balistik Darbe Etkisindeki Performansının Belirlenmesi. *SAVTEK Savunma Teknolojileri Kongresi*, 24-25 Haziran 2004, ODTÜ, Ankara.

(Determination of the Performance of Cold Forming Sheet Metal under Ballistic Impact.)

2) Kurtaran, H. ve **Büyük, M.** Sonlu Elemanlar Metoduyla Balistik Darbe Sonucu GT-Model Askeri Araç Kapısında Oluşan Hasarın Tespiti. *SAVTEK Savunma Teknolojileri Kongresi*, 24-25 Ekim 2002, ODTÜ, Ankara.

(Determination of Damage to GT-Model Military Vehicle Door as a Result of Ballistic Impact with Finite Element Method.)

1) Kayabaşı, O., **Büyük, M.** ve Kurtaran, H. Kalça Protezinin Modellenmesi ve Sonlu Elemanlar Yöntemi ile Analizi. *9. Biomedikal Bilimi ve Teknolojisi Sempozyumu*, 19-22 Eylul 2002, Kemer, Antalya.

(Modeling of Hip Prosthesis and Analysis with Finite Element Method.)

15.6. Abstracts with oral presentation at refereed international conferences and published in the proceedings

13) Simsek, M. C., **Büyük M.**, Modeling Terminal Ballistics of 25x137 mm M791 APDS-T Ammunition. *16th LS-DYNA Forum*, October 11-13, 2022, Bamberg, Germany.

12) Du Bois, P., **Buyuk, M.**, He, J., and Kan, S. Development, Implementation and Validation of 3-D Failure Model for Aluminium 2024 for High Speed Impact Applications. *German LS-DYNA Forum*, 12-13 October 2010, Bamberg, Germany.

11) Du Bois, P., **Buyuk, M.**, He, J., and Kan, S. Development, Implementation and Validation of 3-D Failure Model for Aluminium 2024 for High Speed Impact Applications. *11th International LS-DYNA Conference*, 6-8 June 2010, Detroit, Michigan.

10) Du Bois, P., Kan, S., **Buyuk, M.**, and He, J. Experimental and Numerical Investigation of Fracture in Aluminum. *7th European LS-DYNA Conference*, 14-15 May 2009, Salzburg, Austria.

9) **Buyuk, M.**, and Kan, S. Application of Meshfree Methods for Airworthiness. *10th U.S. National Congress on Computational Mechanics*, 16-19 July 2009, Columbus, OH.

8) **Buyuk, M.**, Marzougui, D., Digges, K., and Kan, S. Impact Performance Evaluation of thermo-Plastic Fuel Tanks by using Meshfree Methods. *10th U.S. National Congress on Computational Mechanics*, 16-19 July 2009, Columbus, OH.

7) **Buyuk, M.**, Wu, C. T., and Kan, S. Applications of Meshfree Methods for Ballistic Impact Performance Analysis of Ductile Materials. *9th U.S. National Congress on Computational Mechanics*, 23-26 July 2007, San Francisco, CA.

6) **Buyuk, M.**, Marzougui, D., and Kan, S. On the V&V Procedures of Full-Scale Vehicle Crashworthiness and Roadside Hardware Performance Evaluation Simulations. *9th U.S. National Congress on Computational Mechanics*, 23-26 July 2007, San Francisco, CA.

5) **Buyuk, M.**, and Kan, C. D. Moving Beyond the Finite Elements: Fan Blade - Bird Strike Analysis by using SPH Methodology. *4th German LS-DYNA Forum*, 20-21 Oct 2005, Bamberg, Germany.

4) Kernstock, T., **Buyuk, M.**, Mohan, P., and Kan, C. D. An Inverse Approach to Identify the Constitutive Model Parameters of Aluminum Honeycomb Materials. *4th German LS-DYNA Forum*, 20-21 Oct 2005, Bamberg, Germany.

3) **Buyuk, M.**, Kan, C. D., and Marzougui, D. Vulnerability-Survivability and Lethality Assessment of Vehicles and occupants under Blast Loading. *8th U.S. National Congress on Computational Mechanics*, 25-27 July 2005, Austin, Texas.

2) **Buyuk, M.**, Kan, C. D., and Marzougui, D. Moving Beyond the Finite Elements: Applications of Meshfree Methods for Transportation Safety Problems. *8th U.S. National Congress on Computational Mechanics*, 25-27 July 2005, Austin, Texas.

1) **Buyuk, M.**, Kildare, S., Kan, C. D., Marzougui, D., and Kurtaran, H. A Successive Inverse Approach to Identify the Constitutive Model Parameters and Mesh - Grid Dependency for Crashworthiness Modeling of Aluminum Honeycombs and Moving Deformable Barriers (MDBs). *5th European LS-DYNA Conference*, 25-26 May 2005, Birmingham, UK.

15.7. Invited speeches, keynote speeches and poster presentations

- Applications of Computational Mechanics on Dynamic Modeling of Materials, Crashworthiness, Airworthiness and Defense, *Middle East Technical University (METU)*, February 2022.
  [**Link**]
- PAGEV Polymer Processing Training, Composite Design Applications, May 2019.
  [**Link**]