

# Mariusz Ziejewski, Ph.D. Inż.

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**Professor, Tenured, Department of Mechanical Engineering**

- **Director of Impact Biomechanics Laboratory, College of Engineering**
- **Director of Automotive Systems Laboratory, Department of Mechanical Engineering**

*North Dakota State University, Fargo, North Dakota 58108*

**Adjunct Associate Professor, Department of Neuroscience, School of Medicine**

*University of North Dakota, Grand Forks, North Dakota 58201*

## **BIOGRAPHICAL SUMMARY**

- *Invited Chairman, "Physics of Blast as it Relates to Brain Injury" scientific peer review for the Department of Defense (DoD) Post Traumatic Stress Disorder/Traumatic Brain Injury (PTSD/TBI) Research Program as a part of the Congressionally Directed Medical Research Programs (CDMRP) (Intramural Proposals).*
- *Invited Chairman, "Physics of Blast as it Relates to Brain Injury" scientific peer review for the Department of Defense (DoD) Post Traumatic Stress Disorder/Traumatic Brain Injury (PTSD/TBI) Research Program as a part of the Congressionally Directed Medical Research Programs (CDMRP) (Extramural Proposals).*
- *Invited Reviewer, Scientific Peer Review Panel for Concept Proposals related to brain injuries caused by blasts for the Department of Defense (DoD) Post Traumatic Stress Disorder/Traumatic Brain Injury (PTSD/TBI) Research Program as a part of the Congressionally Directed Medical Research Programs (CDMRP).*
- *Invited Reviewer, Scientific Peer Review Panel for Intramural Clinical Diagnosis Proposals related to brain injuries caused by blasts for the Department of Defense (DoD) Post Traumatic Stress Disorder/Traumatic Brain Injury (PTSD/TBI) Research Program as a part of the Congressionally Directed Medical Research Programs (CDMRP).*
- *Invited Reviewer, Scientific Peer Review Panel for Moderate-Severe Traumatic Brain Injury, Intramural War Supplement Program, 2008 DoD*
- *Founding Chairman, North American Brain Injury Society's (NABIS) Blast Injury Institute, 2007-present.*
- *Elected to serve on the International Brain Injury Association's (IBIA) Board of Governors (Stockholm, Sweden) 2003-present*
- *Board member of the North American Brain Injury Society (NABIS) 2004-present.*
- *Vice-Chair of the North American Brain Injury Society (NABIS) 2011-present.*
- *Director for Biomechanics Section of the North American Brain Injury Society (NABIS).*
- *Chair, "Brain Injury: New Science, Best Practice, and Future Innovations," North American Brain Injury Society conference Poster Presentations, Amelia Island, FL. September 22-24, 2005.*
- *Development of soccer headgear national standards for American Society for Testing and Materials (ASTM), F08.53 Task Group on Soccer Headgear Subcommittee.*
- *Faculty member lecturing on biomechanical aspects of pathology in the nervous system secondary to trauma as a part of Neuroanatomy and Neurophysiology Course (NEUPSY 805) at the Fielding Institute with APA accredited Ph.D. Program in Clinical Psychology for the semester of 9/97-1/98.*
- *Former Member of the National Highway Traffic Safety Administration (NHTSA) Collaboration Group on Human Brain Modeling. 1992-1997.*
- *Member of the United States Engineering Education Delegation to the Republic of South Africa with assigned area of emphasis in bioengineering education. 1996.*
- *Selected to conduct research for the Armstrong Aerospace Medical Research Laboratory, Human System Division, Wright-Patterson Air Force Base, Dayton, Ohio during their 1996 and 1997 Summer Research Program. Projects included laboratory studies of human body responses to impact, head/neck biodynamic modeling, development of Biodynamics Injury Criteria for the human spine.*
- *President (2000 – 2002) and Chairman of the Activities Committee (1996 – 2000) involved in human body dynamic validation research studies for the Articulated Total Body (ATB) User's Group organized by the Armstrong Aerospace Medical Research Laboratory, Human System Division, Wright-Patterson Air Force Base, Dayton, Ohio.*
- *Collaborator to the Society of Automotive Engineers (SAE) Human Mechanical Response and Injury Criteria Task Group.*
- *Taught a variety of subjects over 35 years in the mechanical engineering field including biomechanics, vehicle dynamics, kinematics (human body dynamics) and computer modeling and simulation*
- *For over 20 years research focus on human body biomechanics*
- *Authored two (2) book chapters and over eighty (80) technical refereed articles.*
- *Invited Key Presentations:*
  - *"Biomechanical Perspective on Low Energy Impacts Causing Serious Long Term Consequences," and "State-of-the-Art Biomechanical Issues In Relation to Mild Traumatic Brain Injury," 5<sup>th</sup> World Congress on Brain Injury, International Brain Injury Association, Stockholm, Sweden, May 2003.*
  - *"Biomechanical Issues Related to Reduction of Trauma to the Brain from Unanticipated Low Impacts in Soccer," Chairman's Roundtable Discussion on Head Injury and Youth Sports, United States Consumer Products Safety Commission, Washington, D.C., May, 2000.*
  - *"Panel Discussion: Blast Injuries and Traumatic Brain Injury," North American Brain Injury Society, Brain Injury Conference of the Americas, Miami, FL., September 2006.*
- *Compliance Testing FMVSS 223 Rear Impact Guards & 224 Rear Impact Protection, B.L. Industries 2004-2005.*
- *Editorial board, Brain Injury Professional*
- *Emergency Room (ER) Biomechanical Brain Injury Evaluation Research, FM Ambulance Service, MeritCare Trauma Center, Sponsored in part by MeritCare Foundation, Fargo, ND, 2001-2005.*
- *Certified in Crash Data Analysis, Sponsored by GM, Vetronix and Texas Eng. Ext., Santa Barbara, CA, 2001.*
- *Certified completion of Injury Scaling: Uses and Techniques Course (AIS Scale), April 2005. Sponsored by the AAAM.*
- *Completion of Injury Scaling (AIS) Update Course, June 2008, Sponsored by the AAAM. Advanced course with suggested prerequisites including at least 2 years of active engagement in AIS coding.*
- *PC Crash Fundamentals Workshop, Las Vegas, NV 2007.*
- *Fully Accredited Accident Reconstructionist (ACTAR #1939)*

## EDUCATION

### ENGINEERING

- Aug. 1985 · *Ph.D. in Engineering, North Dakota State University, Fargo, ND*  
*Major area: Mechanical Engineering*
- June 1978 · *Postgraduate education, Superior Automotive Officer School, Poland*
- July 1977 · *Masters of Science in Agricultural Engineering (Equivalent of Bioengineering)*  
*Academy of Technology and Agriculture, Poland*
- June 1975 · Secondary Major, *Bachelor of Science in Agriculture (Equivalent of Biological Sciences)*  
*Academy of Technology and Agriculture, Poland*
- June 1975 · Primary Major, *Bachelor of Science in Mechanical Engineering*  
*Academy of Technology and Agriculture, Poland*

### ANATOMY AND PHYSIOLOGY

- May 1995 · *Medical Neurosciences, School of Medicine,*  
*University of North Dakota, Grand Forks, North Dakota*
- May 1993 · *Human Anatomy and Physiology,*  
*North Dakota State University, Fargo, North Dakota*
- Dec. 1974 · *Physiology*  
*Academy of Technology and Agriculture, Poland*
- Dec. 1974 · *Biochemistry*  
*Academy of Technology and Agriculture, Poland.*
- June 1973 · *Anatomy*  
*Academy of Technology and Agriculture, Poland.*

## CONTINUING EDUCATION

### BIOMECHANICS

2011

- American Society of Testing and Materials (ASTM) Conference, Subcommittee F08.53 Headgear Subcommittee F08.51 Medical Aspects and Biomechanics, Anaheim, CA
- 9<sup>th</sup> Annual Conference on Brain Injury & North American Brain Injury Society's (NABIS) Conference, New Orleans, LA
- American Society of Testing and Materials (ASTM) Conference, Subcommittee F08.53 Headgear Subcommittee F08.51 Medical Aspects and Biomechanics, Tampa, FL

2010

- National Association of State Head Injury Administrators (NASHA) and North American Brain Injury Society's (NABIS) Brain Injury Partnerships: NASHA & NABIS Conference, Minneapolis, MN.
- North American Brain Injury Society (NABIS) and Alaska Brain Injury Network's (ABIN) Alaska Brain Injury Conference, Anchorage, AK.
- 8<sup>th</sup> World Congress on Brain Injury, International Brain Injury Association, Washington, DC
- American Society of Testing and Materials (ASTM) Conference, Subcommittee F08.53 Headgear Subcommittee and Subcommittee F08.51 Medical Aspects and Biomechanics, St. Louis, MO.
- International Brain Mapping and Intraoperative Surgical Planning Society 2010 World Congress, Bethesda, MD.

2009

- North American Brain Injury Society's (NABIS) Brain Injury Conference of the Americas, Austin, TX
- American Society of Testing and Materials (ASTM) Conference, Subcommittee F08.53 Headgear Subcommittee and Subcommittee F08.51 Medical Aspects and Biomechanics, Atlanta, GA.

2008

- North American Brain Injury Society's (NABIS) Brain Injury Conference of the Americas, New Orleans, LA
- Veteran's Health Administration's Visual Consequences of Traumatic Brain Injury Conference, Billerica, MA
- Blast Injury Symposium, Wayne State University, Detroit, MI
- 7<sup>th</sup> World Congress on Brain Injury, International Brain Injury Association, Lisbon, Portugal
- 11<sup>th</sup> Annual Conference, The New York Academy of Traumatic Brain Injury, New York, NY
- Traumatic Brain Injury Consortium/Think Tank Session, College Station, TX

2007

- North American Brain Injury Society's Blast Injury Institute Mid-Winter Conference, Washington, DC
- North American Brain Injury Society, Brain Injury Conference of the Americas, San Antonio, TX
- Emergency World Summit, An American Auto Safety Tragedy: Roof Crush, Washington, DC
- 10<sup>th</sup> Annual Conference, The New York Academy of Traumatic Brain Injury, New York, NY

2006

- Biomedical Engineering Society, 2006 Annual Fall Meeting, Chicago, IL
- Brain Injury Association of Illinois, Annual Conference, Chicago, IL
- North American Brain Injury Society, Brain Injury Conference of the Americas, Miami, FL
- 8<sup>th</sup> International Neurotrauma Symposium, Traumatic Brain Injury, Spinal Cord Injury – The Silent Epidemic of the 21<sup>st</sup> Century, Rotterdam, The Netherlands
- Society of Automotive Engineers Seminar, Occupant and Vehicle Responses in Rollovers, Troy, Michigan\*

2005

- American Society of Testing and Materials (ASTM) Conference, Subcommittee F08.53 Task Group on Soccer Headgear, Dallas, TX
- American Society of Testing and Materials (ASTM) Conference, Subcommittee F08.53 Task Group on Soccer Headgear, Reno, NV
- Spring 2005 Brain Injury Conference: "Biomechanics and Physiological Impact of Traumatic Brain Injury" and American Academy for the Certification of Brain Injury Specialists (AACBIS). Memphis, TN
- Certified Completion of *Injury Scaling: Uses and Techniques* Course (AIS Scale). Sponsored by the Association for the Advancement of Automotive Medicine (AAAM). Approved by the American Health Information Management Association and satisfies the requirements of the Clinical Data Management core educational content area. Meets the Board of Certification for Emergency Nursing's (BCEN) Category of Clinical and has the approval of the Emergency Nurse's Association (ENA)

2004

- ATB Model Users' Group Conference, Salt Lake City, UT
- American Society of Testing and Materials (ASTM) Conference, Subcommittee F08.53 Task Group on Soccer Headgear, Salt Lake City, UT
- Fifth Annual – Managing Challenging Situations in Brain Injury Care Conference, Bethesda Rehabilitation Hospital, HealthEast, Minneapolis, MN
- Brain Injury Association of Indiana, "Contemporary Issues In Brain Injury Litigation", Indianapolis, IN
- Fifth Annual Brain Injury Association of America, Napa Valley, CA
- 16<sup>th</sup> Annual Medical & Legal Issues in Brain Injury; North American Brain Injury Society, Brain Injury Association of America, and International Brain Injury Association; Amelia Island, Florida
- The Biomechanics of Brain Injury, Mt. Sinai Medical Center, Brain Injury Association of NY, New York, NY
- 5<sup>th</sup> World Congress of Brain Injury, International Brain Injury Association, Stockholm, Sweden
- American Society of Testing and Materials (ASTM) Conference, Subcommittee F08.53 Task Group on Soccer Headgear, Kansas City, KS
- Congress of the European Federation of Neurological Societies, International Brain Injury Association Vienna, Austria.
- Fourth Annual Brain Injury Association of America, Napa Valley, CA
- ATB Model Users' Group Conference sponsored by the US Air Force Research Laboratory, Patuxent Naval Air Station, Patuxent River, MD

2001

- The Brain Injury Association's, 20<sup>th</sup> Annual Symposium, Atlanta, GA

2000

- The Biomechanics of Brain Injury, Mt. Sinai Medical Center, Brain Injury Association of NY, New York, NY
- Sports Related Concussions Workshop, ASTM Subcommittee F08.51 on Medical Aspects and Biomechanics, Orlando, FL
- Biomechanics Research: Experimental and Computational, Proceedings of the Twenty-Seventh International Workshop, National Highway Traffic Safety Administration, Atlanta, GA 44<sup>th</sup> Stapp Car Crash Conference, Atlanta, GA\*
- ATB Model Users' Group Conference, Wichita State University, Wichita, KS\*
- American Society for Testing and Materials Conference, Montreal, Quebec, Canada

1999

- Brain Injury Conference, Bancroft NeuroHealth, Philadelphia, PA

1998

- NATO/RTO Specialist Meeting, Dayton, OH
- 5<sup>th</sup> International LS-DYNA Users Conference, Detroit, MI\*
- ATB Model Users' Group Conference sponsored by US Air Force Armstrong Laboratory, Dayton, OH

1997

- Aerospace Medical Association Annual Scientific Meeting in Chicago, IL (May)
- ATB Model Users' Group Conference, US Air Force Armstrong Laboratory, Charlottesville, VA (Apr.)\*

1996

- Society of Automotive Engineers, 40th Stapp Car Crash Conference, Albuquerque, N.M. (Nov.)\*
- NATO/AGARD Specialists' Meeting on Impact Head Injury (Nov.)\*
- ATB Model Users' Group Conference, US Air Force Armstrong Laboratory, Phoenix, AZ (Feb.)\*

1995

- Twenty-Third International Workshop on Human Subjects for Biomechanical Research, US Department of Transportation, National Highway Traffic Safety Administration, San Diego, CA (Nov.)
- Society of Automotive Engineers, 39th Stapp Car Crash Conference, San Diego, CA (Nov.)
- Accidental Injury: Biomechanics & Prevention, sponsored by University of California, San Diego School of Medicine, San Diego, CA (Nov.)
- ATB Model Seminar, Wright-Patterson Air Force Base, Dayton, OH (June)\*
- LS-DYNA3D Seminar LSTC, Livermore, CA (March)

1994

- *“The Biomechanics of Impact and its Relationship to Crash Performance Standards,”* sponsored by Association for the Advancement of Automotive Medicine (AAAM) in cooperation with International Research Council on the Biomechanics of Impact (IRCOBI), Philadelphia, PA (Oct.)
- International Symposium on Head Injury Research, *“Head Injury ‘94,”* sponsored by the U.S. Department of Transportation’s National Highway Traffic Safety Administration, Oct. 12-14, 1994, Washington, D.C.

1993

- Society of Automotive Engineers, International Congress & Exposition, Detroit, MI (Feb.) \*

1991

- Society of Automotive Engineers, International Congress & Exposition, Detroit, MI (Feb.) \*

1988

- Society of Automotive Engineers, International Congress & Exposition, Detroit, MI (Feb.) Seminar on Injuries, Anatomy, Biomechanics and Federal Regulation \*

1986

- Society of Automotive Engineers, International Congress & Exposition, Detroit, MI (Feb.) \*

1984

- Society of Automotive Engineers, International Congress & Exposition, Detroit, MI (Feb.) \*

1982

- Society of Automotive Engineers, International Congress & Exposition, Detroit, MI (Feb.) \*

\* Also listed under Vehicle Structure-Vehicle Dynamics

**VEHICLE STRUCTURE - VEHICLE DYNAMICS**

2007

- PC Crash Fundamentals Workshop, Las Vegas NV

2006

- Society of Automotive Engineers Seminar, Occupant and Vehicle Responses in Rollovers, Troy, Michigan\*

2001

- Crash Data Retrieval (CDR) Training and Certification, Sponsored by General Motors, Vetronix and Texas Engineering Extension Service (TEEX), (Airbag sensing and diagnostic module, vehicle speed, change in velocity, seatbelt usage, etc.) Santa Barbara, CA

2000

- ATB Model Users' Group Conference, Wichita State University, Wichita, KS\*
- 44<sup>th</sup> Stapp Car Crash Conference, Atlanta, GA\*

1998

- 5<sup>th</sup> International LS-DYNA Users Conference, Detroit, MI\*

1997

- ATB Model Users' Group Conference, US Air Force Armstrong Laboratory, Charlottesville, VA (Apr.)\*

1996

- Society of Automotive Engineers, 40th Stapp Car Crash Conference, Albuquerque, NM (Nov.)\*
- NATO/AGARD Specialists' Meeting on Impact Head Injury (Nov.)\*
- ATB Model Users' Group Conference, US Air Force Armstrong Laboratory, Phoenix, AZ (Feb.)\*

- 1995
- ATB Model Seminar, Wright-Patterson Air Force Base, Dayton, OH (June)\*
  - LS-DYNA3D Seminar LSTC, Livermore, CA (March)\*
- 1993
- Society of Automotive Engineers, International Congress & Exposition, Detroit, MI (Feb.) \*
  - Society of Automotive Engineers, International Off-Highway Congress & Exposition, Milwaukee, WI (Sept.)
- 1992
- Society of Automotive Engineers, International Off-Highway Congress & Exposition, Milwaukee, WI (Sept.)
- 1991
- Society of Automotive Engineers, International Congress & Exposition, Detroit, MI (Feb.) \*
  - Society of Automotive Engineers, International Off-Highway Congress & Exposition, Milwaukee, WI (Sept.)
- 1990
- Society of Automotive Engineers, International Off-Highway Congress & Exposition, Milwaukee, WI (Sept.)
- 1989
- Society of Automotive Engineers, International Off-Highway Congress & Exposition, Milwaukee, WI (Sept.)
  - Society of Automotive Engineers, International Congress & Exposition, Detroit, MI (Feb.) Seminar on Accident Reconstruction, Using CRASH3 Computer Program
- 1988
- Society of Automotive Engineers, International Congress & Exposition, Detroit, MI (Feb.) Seminar on Injuries, Anatomy, Biomechanics and Federal Regulation \*
  - Society of Automotive Engineers, International Off-Highway Congress & Exposition, Milwaukee, WI (Sept.)
- 1987
- Society of Automotive Engineers, International Off-Highway Congress & Exposition, Milwaukee, WI (Sept.)
- 1986
- Society of Automotive Engineers, International Congress & Exposition, Detroit, MI (Feb.) \*
- 1984
- Society of Automotive Engineers, International Congress & Exposition, Detroit, MI (Feb.) \*
- 1983
- Society of Automotive Engineers, International Off-Highway Congress & Expo., Milwaukee, WI (Sept.)
- 1982
- Society of Automotive Engineers, International Congress & Exposition, Detroit, MI (Feb.)

\* Also listed under Biomechanics

## WORK EXPERIENCE

- 9/11 to present *Vice-Chair, of the North American Brain Injury Society (NABIS)*
- 5/04 *Researcher, Compliance Testing FMVSS 223 Rear Impact Guards & 224 Rear Impact Protection for B.L. Industries*
- 2/04 to present *Board member for North American Brain Injury Society*
- 7/03 to present *Board of Governors Member for International Brain Injury Association*
- 4/03 to present *Board of Advisors Member for Neurotrauma Registry, www.neurotraumaregistry.com*
- 11/02 to present *Member, American Society of Testing and Materials (ASTM) F08 Sports Equipment and Facilities Committee, F08.51 Medical Aspects and Biomechanics Subcommittee & F08.53 Task Group on Soccer Headgear Subcommittee*
- 6/01 to present *Collaborator, Emergency Room (ER) Biomechanical Brain Injury Evaluation Research, Meritcare Trauma Center, Fargo, ND*
- 7/98 to present *Adjunct Associate Professor, Department of Neuroscience at the University of North Dakota School of Medicine, Grand Forks, ND.*
- 12/97 to present *Director of Impact Biomechanics Laboratory, College of Engineering and Architecture at North Dakota State University, Fargo, ND.*
- 10/92 to present *Director of Automotive Systems Laboratory Dept. of Mechanical Eng. & Applied Mechanics, North Dakota State University, Fargo, ND.*
- 9/97 to 9/98 *Faculty Member invited to lecture on biomechanical aspects of pathology in the nervous system secondary to trauma as a part of Neuroanatomy and Neurophysiology Course (NEUPSY 805) at the Fielding Institute with APA accredited Ph.D. Program in Clinical Psychology.*

5/97 to 8/97	<u>Researcher</u> , <i>United States Air Force Office of Scientific Research, Summer Research Program, Occupant Biodynamics Modeling, Armstrong Laboratory, Wright-Patterson Air Force Base, Dayton, OH.</i> <i>Project involvement: laboratory studies of human body response to impact, head/neck biodynamic modeling, development of biodynamics Injury Criteria for the human.</i>
5/96 to 9/96	<u>Researcher</u> , <i>United States Air Force Office of Scientific Research, Summer Research Program, Occupant Biodynamics Modeling, Armstrong Laboratory, Wright-Patterson Air Force Base, Dayton, OH.</i> <i>Project involvement: laboratory studies of human body response to impact, head/neck biodynamic modeling, development of biodynamics Injury Criteria for the human.</i>
5/92	<u>Tenured Associate Professor</u> , <i>Dept. of Mechanical Engineering &amp; Applied Mechanics, North Dakota State Univ., Fargo, ND.</i>
9/86 to 4/92	<u>Assistant Professor</u> , <i>Dept. of Mechanical Engineering &amp; Applied Mechanics, North Dakota State Univ., Fargo, ND.</i>
9/85 to 9/86	<u>Lecturer</u> , <i>Dept. of Mechanical Engineering &amp; Applied Mechanics North Dakota State University, Fargo, ND.</i>
11/80 to 8/85	<u>Research Assistant</u> , <i>Dept. of Agricultural Engineering North Dakota State University, Fargo, ND.</i>
4/80 to 11/80	<u>Exchange Scientist</u> , <i>Agricultural Engineering Department, North Dakota State University, Fargo, ND</i>
11/77 to 4/80	<u>Assistant Professor</u> , <i>Mechanical Engineering Department Academy of Technology and Agriculture, Bydgoszcz, Poland.</i>
11/77 to 4/80	<u>Instructor</u> , <i>National Institute of Advanced Technical Education (Center of Technology Progress and Staff Perfection).</i>

### Special Appointments

2012	<i>Chair, Peer Review Panel, Integrated Eye Tracking and Neural Monitoring for Enhanced Assessment of Mild TBI, Psychological Health, Polytrauma, and Operational Health (PHPOH), U.S. Army Medical Research and Materiel Command (USAMRMC)</i>
2012	<i>Invited Reviewer, "Evaluation of Cervical Spine Mechanical Properties and Injury at High Loading Rate for WIAMan," scientific peer review for the Department of Defense (DoD), Warrior Injury Assessment Manikin (WIAMan) Program, United States Medical Research and Materiel Command (USAMRMC).</i>
2012	<i>Invited Reviewer, "Human Injury Tolerance toward Development and Validation of a Warrior Manikin," scientific peer review for the Department of Defense (DoD), Warrior Injury Assessment Manikin (WIAMan) Program, United States Medical Research and Materiel Command (USAMRMC).</i>
2012	<i>Invited Reviewer, "Impact Biomechanics of Under-Belly Blast Loading Experienced by Mounted Soldiers," scientific peer review for the Department of Defense (DoD), Warrior Injury Assessment Manikin (WIAMan) Program, United States Medical Research and Materiel Command (USAMRMC).</i>
2012	<i>Invited Reviewer, "Instrumentation for Support of WIAMan Program: New Sensor Types and Data Recorder Capabilities must be used to Support Quantifying Human Injury Thresholds in Blast Environments," scientific peer review for the Department of Defense (DoD), Warrior Injury Assessment Manikin (WIAMan) Program, United States Medical Research and Materiel Command (USAMRMC).</i>
2012	<i>Invited Reviewer, "The Development of a Virtual 3D Surgical Atlas for Craniofacial Battlefield Injured: A New Paradigm in Preparing Surgeons to Treat Facial Trauma," scientific peer review for the Department of Defense (DoD), United States Army Medical Research and Materiel Command (USAMRMC).</i>
2011 to present	<i>Advisory Group Member for the Traumatic Brain Injury – Resource Optimization Center (TBI-ROC)</i>
2011	<i>Chair, BII Blast Panel, North American Brain Injury Society (NABIS) Ninth Annual Conference on Brain Injury, New Orleans, LA, September, 14-17</i>
2011	<i>Chair, for the North American Brain Injury Society (NABIS) Ninth Annual Conference on Brain Injury Abstract Sessions, New Orleans, LA, September, 14-17</i> <ol style="list-style-type: none"> <li>1. "Research and Outcomes"</li> <li>2. "Medical Management II"</li> <li>3. "MTBI, Rehab/Education"</li> </ol>

- 2011 to present Vice-Chair of the North American Brain Injury Society (NABIS), “9<sup>th</sup> Annual Conference on Brain Injury.” New Orleans, LA, Sept. 15-17, 2011.
- 2011 Moderator for North American Brain Injury Society (NABIS) Blast Panel, “9<sup>th</sup> Annual Conference on Brain Injury.” New Orleans, LA, Sept. 15-17, 2011
- 2011 Planning Committee Member for North American Brain Injury Society (NABIS)
- 2011 Chairman of the Surfaces & Injury Prevention Section at the 5<sup>th</sup> Asia-Pacific Congress in Sports Technology, Melbourne, Australia
- 2010 to present Editor-in-Chief for NABIS Conferences and Proceedings
- 2011 Chairman, Paper/Poster Chairman for the North American Brain Injury Society Conference, “9<sup>th</sup> Annual Conference on Brain Injury.” New Orleans, LA, Sept. 15-17, 2011
- 2010 to 2014 Re-elected to Board of Governors, International Brain Injury Association for the term 2010-2014
- 2010 Moderator for National Association of State Head Injury Administrators (NASHIA) and North American Brain Injury Society’s Brain Injury Partnerships: NASHIA & NABIS Conference, Minneapolis, MN.
- 2010 Chairman, Paper/Poster Chairman for the North American Brain Injury Society Conference, “8<sup>th</sup> Annual Conference on Brain Injury.” Minneapolis, MN, Oct. 6-9, 2010
- 2010 Reviewer, Proposal for the United States Army Medical Research and Materiel Command (USAMRMC) Military Medical Research and Development Grant Program
- 2009 Reviewer, Intramural Proposals for the Department of Defense (DoD) Defense Medical Research and Development Program, Intramural Applied Research and Advanced Technology Development Award
- 2009 Chairman, Paper/Poster Chairman for the North American Brain Injury Society Conference, “7<sup>th</sup> Annual Conference on Brain Injury.” Austin, TX, Oct. 14-17, 2009.
- 2009 Moderator, MTBI/Blast Panel, North American Brain Injury Society conference, “7<sup>th</sup> Annual Conference on Brain Injury.” Austin, TX, Oct. 14-17, 2009.
- 2009 to present Planning Committee Member for North American Brain Injury Society conferences occurring in 2010
- 2009 to present Board Member for North American Brain Injury Society
- 2008 to present Invited Advisory Group Member, Traumatic Brain Injury – ROC (Resource Optimization Center)
- 2008 Reviewer, Proposals for the Military Operational Medical Research Program, US Army Materiel Research Command (USAMRMC).
- 2008 Reviewer, Intramural Proposals for the Department of Defense (DoD) Intramural War Supplement Program.
- 2008 Chairman, Paper/Poster Chairman for the North American Brain Injury Society conference, “6<sup>th</sup> Annual Conference on Brain Injury.” New Orleans, LA. Oct. 2-4, 2008.
- 2008 Invited Speaker, Invited by a former US Air Force Surgeon General to make a presentation on the Physics of Blast Injury to a special conference/think tank session on allocation of Department of Defense (DoD) funding for TBI/blast injuries.
- 2007 Chairman, “Physics of Blast as it Relates to Brain Injury” peer review for the Department of Defense (DoD) Post Traumatic Stress Disorder/Traumatic Brain Injury (PTSD/TBI) Research Program as a part of the Congressionally Directed Medical Research Programs (CDMRP).
- 2007 Chairman, Extramural Proposals related to brain injuries caused by blasts for the Department of Defense (DoD) Post Traumatic Stress Disorder/Traumatic Brain Injury (PTSD/TBI) Research Program as a part of the Congressionally Directed Medical Research Programs (CDMRP).
- 2007 Reviewer, Concept Proposals related to brain injuries caused by blasts for the Department of Defense (DoD) Post Traumatic Stress Disorder/Traumatic Brain Injury (PTSD/TBI) Research Program as a part of the Congressionally Directed Medical Research Programs (CDMRP).
- 2007 Reviewer, Intramural Proposals on clinical diagnosis related to brain injuries caused by blasts for the Department of Defense (DoD) Post Traumatic Stress Disorder/Traumatic Brain Injury (PTSD/TBI) Research Program as a part of the Congressionally Directed Medical Research Programs (CDMRP).
- 2007 to present Chairman, North American Brain Injury Society’s (NABIS) Blast Injury Institute.
- 2007 Chairman, Sports Medicine Section for the 3<sup>rd</sup> Asia-Pacific Congress on Sports Technology, Singapore, September 23-26, 2007
- 2007 Chairman, Paper/Poster Chairman for the North American Brain Injury Society conference, “5<sup>th</sup> Annual Conference on Brain Injury.” San Antonio, TX. September 27-29, 2007.
- 2007 Planning Committee, North American Brain Injury Society Conference, to be held in New Orleans, LA in 2008.

2007	<i>Planning Committee, Blast Injury Institute, North American Brain Injury Society, Midwinter Conference, Washington, DC, November 2007.</i>
2006	<i>Planning Committee, North American Brain Injury Society conference “Brain Injury Conference of the Americas”, Miami, FL. September 14-16, 2006.</i>
2006	<i>Paper/Poster Chair, North American Brain Injury Society conference, “Brain Injury Conference of the Americas”, Miami, FL. September 14-16, 2006.</i>
2005	<i>Presentation Chair, North American Brain Injury Society conference “Brain Injury: New Science, Best Practice, and Future Innovations,” Amelia Island, FL. September 22-24, 2005.</i>
2004 to present	<i>Director for Biomechanics section of North American Brain Injury Society</i>
2004 to present	<i>Board Member for North American Brain Injury Society</i>
2003 to 2009	<i>Board of Governors for International Brain Injury Association</i>
2003 to present	<i>Board of Advisors for Neurotrauma Registry, www.neurotraumaregistry.com</i>
2002 to present	<i>Development of soccer headgear national standards for American Society for Testing and Materials (ASTM), Member of F08 Sports Equipment and Facilities Committee, F08.51 Medical Aspects and Biomechanics Subcommittee &amp; F08.53 Task Group on Soccer Headgear Subcommittee</i>
2002 to present	<i>American Society for Testing and Materials (ASTM), Member of F08.51 Medical Aspects and Biomechanics Subcommittee</i>
2001 to present	<i>Emergency Room (ER) Biomechanical Brain Injury Evaluation, F M Ambulance, Meritcare Trauma Center, Fargo, ND</i>
1997 to 1998	<i>Collaborator to the Society of Automotive Engineers (SAE) Human Mechanical Response and Injury Criteria Task Group.</i>
1996	<i>Member of United States Engineering Education Delegation to the Republic of South Africa (Assigned area of emphasis - bioengineering education)</i>
Started 1994	<i>Member of the National Highway Traffic Safety Administration (NHTSA) Collaboration Group on Human Brain Modeling.</i>
2000 to 2002	<i>President of the Articulated Total Body (ATB) User’s Group organized by the Armstrong Aerospace Medical Research Laboratory, Human System Division, Wright-Patterson Air Force Base, Dayton, Ohio.</i>
1996 to 2000	<i>Chairman of Activities Committee including validation studies and data base development for the Articulated Total Body (ATB) User’s Group organized by the Armstrong Aerospace Medical Research Laboratory, Human System Division, Wright-Patterson Air Force Base, Dayton, Ohio.</i>
1995 to 1996	<i>Member of the Technical Program Committee for the Articulated Total Body (ATB) User’s Group organized by the Harry G. Armstrong Aerospace Medical Research Laboratory, Human System Division.</i>
1995 to 1996	<i>Chair of the Technical Proceedings Committee for the Articulated Total Body (ATB) User’s Group organized by the Harry G. Armstrong Aerospace Medical Research Laboratory, Human System Division.</i>
<b>Teaching Activity</b>	<i>Biomechanics Vehicle Dynamics Kinematics (Human Body Dynamics) Ph.D. and MS Theses Senior Design Projects Mechanical Systems Laboratory</i>
<b>Research Activity</b>	<i>Human Brain Modeling</i> <ul style="list-style-type: none"> <li>• <i>National Highway Traffic Safety Administration</i></li> <li>• <i>Department of Defense</i></li> </ul> <i>Laboratory studies of human body responses to impact and head/neck biodynamic modeling</i> <ul style="list-style-type: none"> <li>• <i>Armstrong Aerospace Medical Research Laboratory, Human System Division, Wright-Patterson Air Force Base</i></li> </ul> <i>Vehicle Dynamics Analysis Statistical Methods</i>
<b>University Special Appointments</b>	<i><u>Chair</u>, Mechanical Engineering Promotion and Tenure Evaluation Committee <u>Chair</u>, College of Engineering and Architecture Promotion and Tenure Evaluation Committee <u>Member</u>, College of Engineering and Architecture Executive Committee <u>Member</u>, University Faculty Senate <u>Member</u>, University Senate Faculty Development Committee</i>



**Editor**

*Editor-in-Chief for NABIS Conferences and Proceedings*  
*Brain Injury Professional*  
*Open Mechanics Journal*  
*International Journal of Mechanics and Solids*

**Membership**

*North American Brain Injury Society (NABIS), Board Member*

- *Vice-Chairman, 2011*
- *Board member since 2004*
- *Editor-in-Chief for Conferences and Proceedings*
- *Founding Chair of Blast Injury Institute*
- *Director of the Biomechanics Section*
- *Conference Planning Committee member*
- *Moderator for National Association of State Head Injury Administrators (NASHIA) and North American Brain Injury Society's Brain Injury Partnerships: NASHIA & NABIS Conference, Minneapolis, MN, Oct. 6-9, 2010*
- *Moderator for North American Brain Injury Society (NABIS) Blast Panel, "9<sup>th</sup> Annual Conference on Brain Injury." New Orleans, LA, Sept. 15-17, 2011*

*American Society of Testing Materials (ASTM)*

- *Member of Subcommittee F08.53 on Headgear and Helmets*
- *Member of Committee F08.51 on Medical Aspects and Biomechanics*

*International Brain Injury Association (IBIA)*

- *Elected to the Board of Governors since 2003*

*Member, Society of Automotive Engineers (SAE)*  
*American Society of Mechanical Engineers (ASME), Bioengineering Division*  
*Association for the Advancement of Automotive Medicine (AAAM)*  
*American Society of Biomechanics*

**PUBLICATIONS****BOOK CHAPTERS**

Ziejewski, M., and Karami, G. – 2012

“Biomechanical Perspective on Blast Injury,” in: *Concussive Brain Trauma: Neurobehavioral Impairment and Maladaptation* by Dr. Rolland Parker, Taylor & Francis Group, Boca Raton, FL.

Ziejewski, M. – 1997

“Biomechanics of Head Injury,” in: *Head Trauma Cases: Law and Medicine* by Dr. A.C. Roberts, Second Edition, John Wiley & Sons, Inc.

Ziejewski, M. – 1992

“Engineering Aspects of Head-Neck Injury,” in: *Head and Neck Injury Handbook* by Lawrence J. Smith, Colorado Springs, CO: Shepard's McGraw-Hill, Inc.

**PAPERS**

Dirisala, V., G. Karami, M. Ziejewski – 2012

“Effects of Neck Damping Properties on Brain Response Underimpact Loading,” *International Journal for Numerical Methods in Biomedical Engineering*

Rezaei, A., M. Salimi Jazi, S. Javid, G. Karami, M. Ziejewski – 2012

“Confined Blasts, and the Impact of Shock Wave Reflections on a Human Head and the Related Traumatic Brain Injury,” *Computer Methods in Biomechanics and Biomedical Engineering (In Press)*

Rezaei, A., Karami, G., Ziejewski, M. – 2011

“Simulation of Mechanical Properties of the Brain Matter under Creep-Recovery Tests,” *North American Brain Injury Society (NABIS) Ninth Annual Conference on Brain Injury, New Orleans, LA (In Press)*

Salimi, J., M., A. Rezaie, G. Karami, F. Azami, M. Ziejewski – 2011

“Helmet-Head Interactions under Ballistic Impacts – A Study on the Effects of Padding,” *North American Brain Injury Society (NABIS) Ninth Annual Conference on Brain Injury, New Orleans, LA (In Press)*

- Robinson, M., T. Stousland, M. Baquai, G. Karami, M. Ziejewski – 2011  
 “Reducing effect of softball-to-head impact by incorporating slip-surface in helmet,” *Asia Pacific Congress on Sports Technology (APCST) – Melbourne, Australia*
- Paka, P., G. Karami, M. Ziejewski – 2011  
 “Examination of brain injury under impact with the ground of various stiffness,” *Asia Pacific Congress on Sports Technology (APCST) – Melbourne, Australia*
- Ziejewski, M., E. M. Yliniemi – 2011  
 “Human Head Response Assessment Using Manikin Head Acceleration Pulse in Vertical Impact,” *International Conference in Sport Medicine and Sport Science – Paris, France*
- Paka, P., G. Karami, M. Ziejewski – 2011  
 “Response Interaction of the Brain with the Grounds of Different Materials at Different Impact Velocities,” *19<sup>th</sup> Annual Conference on Mechanical Engineering, May 10-12, Birjand, Iran*
- Paka P., G. Karami, M. Ziejewski – 2010  
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- Dirisala, V., G. Karami, M. Ziejewski – 2010  
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- Sotudeh Chafi, M., V. Dirisala, G. Karami, M. Ziejewski – 2010  
 “A FE Parametric Study of the Dynamic Response of the Human Brain with Different CSF Constitutive Properties,” *Bio-Medical Materials and Engineering*
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 “Effect of Brain Tissue Undulation on Mechanical Properties,” *Brain Injury*, March 2010; 24(3), 52-53.
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 “A Comprehensive Approach to Studying Mild Traumatic Brain Injuries in Motor Vehicle Crashes,” *International Society of Biomechanics and American Society of Biomechanics 2005 Joint Congress*, Cleveland, OH. (*Peer-reviewed abstract*)
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 “Predicting the Forces in a Neck Injury Caused by an Underwater Collision,” *Proceedings of the 15<sup>th</sup> IASTED International Conference on Modeling and Simulation*, Marina Del Ray, CA.
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- Ziejewski, M. – 2004  
 “The Biomechanical Assessment of Traumatic Brain Injury,” *Brain Injury Professional*, 1(1), 26-29.
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 “Practical Parameter for Characterizing the Head-to-Ball Impact and Measuring the Effectiveness of Protective Headgears in Soccer,” *5th International Engineering of Sport Conference*, UC Davis.
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 “Generation of Integrated Skull-Brain Helmet,” *5<sup>th</sup> International LS-DYNA Users Conference*, Detroit, MI.
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 “Assessment of Brain Injury Potential in Design Process of Children’s Helmet Using Rigid Body Dynamics and Finite Element Analysis,” *ATB Model Users’ Group Conference* sponsored by US Air Force Armstrong Laboratory, Dayton, OH.

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“Force Response Characteristics of Square Columns for Selected Materials at Impact Loading Combinations Based on FEA,” SAE Paper #982418, Detroit, MI.
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- Ziejewski, M., B. Anderson, L. Obergefell – 1997  
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“Validation of the Deformable Neck Model for a +Gz Acceleration,” Aerospace Medical Association Annual Scientific Meeting in Chicago, IL.
- Ziejewski, M. – 1996  
“Validation of the Deformable Neck Model for a +Gz Acceleration,” Armstrong Aerospace Medical Research Laboratory, Human System Division, Wright-Patterson Air Force Base.
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“Energy Absorption for Short Duration Impacts,” SAE Paper #961851, Indianapolis, IN.
- Ziejewski, M, X. Pan – 1996  
“Application of Ellipses, Ellipsoids, and Hyperellipsoids in Computer Modeling of Human Body and Interior Surfaces,” 1996 ATB Model Users' Group Conference sponsored by US Air Force Armstrong Laboratory, Phoenix, AZ.
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“3-D Animation Generated from ATB Output,” 1996 ATB Model Users' Group Conference sponsored by US Air Force Armstrong Laboratory, Phoenix, AZ.
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“Apparatus for Premixed Combustion Analysis,” SAE Paper #931675, Milwaukee, WI.
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“A Study of Energy Released During Premixed Combustion,” SAE Paper #931676, Milwaukee, WI.
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“Design Modifications For Durability Improvements For Diesel Engines Operating on Plant Oil Fuels,” SAE Paper #921630, Milwaukee, WI.
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“Dual Fuel System: Instrumentation and Experimentation,” ASEE Annual Conference Proceedings.
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“Computer Simulation of Fuel Nozzle Needle Dynamics,” Twelfth Annual Conference, ADIUS, 1991.
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“Development of an Infrared Method for Ignition Delay Measurements,” SAE Paper #910847, Detroit, MI.
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“PC Based Data Acquisition and Analysis of a Diesel Engine,” ASEE Annual Conference, New Orleans, LA.
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“Apparatus for the Measurement of Ignition Delay Times for Diesel Engine Fuels,” SAE Paper #901617, Milwaukee, WI.
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“Fast Data Acquisition For Internal Combustion Engines Laboratory,” ASME Proceedings of the 1990 International Conference on Computers in Engineering, Vol. 2, Boston, MA.

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 “Numerical Optimization Approach to the Design of a Diesel Engine Fuel Injection Nozzle for Alternate Fuels,” SAE Paper #880492, Detroit, MI.
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 “Reduced Injection Needle Mobility Caused by Lacquer Deposits from Sunflower Oil,” SAE Paper #880493, Detroit, MI.
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 “Statistical Aspects of Testing Alternate Fuels,” SAE Paper #852088, Tulsa, OK.
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 “Diesel Engine Evaluation of a Nonionic Sunflower Oil-Aqueous Ethanol Microemulsion,” *Journal of American Chemists Society (JOACS)*, Vol. 61, No. 10.
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 “Inertia Effect in Magnetic Throughflow of Viscous Fluid in a Slot Between Fixed Surfaces of Revolution,” *Rev. Roum. Sci. Tech. - Mecanique Appliquee*, Tome 23, No. 6, p. 859-969, Bucarest.

## COMPUTER SOFTWARE/MODELS DEVELOPED

“Anatomical Brain Model” – 2000 – Present

The brain model simulates all essential anatomical features of a 50<sup>th</sup> percentile male head, specifically the falx, tentorium, dura, pia and scalp. Validation was carried out against published cadaver tests.

“Elliptical Brain Model” - 1993-1997

A 3-dimensional finite element model representing a human brain.

“Impact” - 1985-1990

The program performs an analysis of single or two vehicle accidents. The program determines the conditions of impact, including the speed of the vehicles at impact and the forces generated during the impact.

“Post-Impact: - 1985-1990

The program performs a simulation of single or two vehicle accidents. The simulation program determines the vehicle trajectory and the rest position.

“Expert System for Experimental Design and Statistical Analysis” - 1991

For use by graduate students in all areas of engineering.

## **PATENTS**

- USA Patent Office, No. 6,726,623 (Principal Investigator) – 2004  
 “Brain Injury Diagnostic System”, registered by M. Ziejewski
- USA Patent Office, No. 4,823,756 (Principal Investigator) – 1989  
 “Two Stage Fuel Injection Nozzle”, registered by M. Ziejewski and H.J. Goettler.
- Poland Patent Office, No. P-2042821 (Principal Investigator) – 1979  
 “Nonoil Cooling Mixture for Metalworking”, registered by M. Ziejewski (rights acquired by Heavy Machinery Industry, Poland).

## **PROFESSIONAL PRESENTATIONS**

### **EUROPE, AFRICA, AND ASIA**

2011

- “Examination of Brain Injury Under Impact with the Ground of Various Stiffness,” 5<sup>th</sup> Asia-Pacific Congress in Sports Technology, Melbourne, Australia
- “Reducing Effect of Softball-to-Head Impact by Incorporating Slip-Surface in Helmet,” 5<sup>th</sup> Asia-Pacific Congress in Sports Technology, Melbourne, Australia

2008

- Ziejewski, M., T. Trudel, “Current Issues in Blast Injury: From Modeling Brain Dynamics to Developing Models of Care,” 7<sup>th</sup> World Congress on Brain Injury, International Brain Injury Association, Lisbon, Portugal.
- “Biomechanics: Use of Evidence Based Physics as a Foundation for Understanding the Nature of Traumatically Induced Brain Injury,” 7<sup>th</sup> World Congress on Brain Injury, International Brain Injury Association, Lisbon, Portugal.

2007

- “Biomechanical Factors in Mild Traumatic Brain Injuries Based on American Football and Soccer Players,” Asia-Pacific Congress on Sports Technology, Singapore.
- “Development of a Biomechanical Knowledge System to Identify Brain Injuries in Emergency Department,” VIP Symposium of Internet Related Research, Venice Italy.

2006

- Ziejewski, M., Z. Kou, C. Doekett, “A Comprehensive Statistical Approach to Assessing Biomechanical Parameters for Mild Traumatic Brain Injury,” Traumatic Brain Injury, Spinal Cord Injury – The Silent Epidemic of the 21<sup>st</sup> Century, 8<sup>th</sup> International Neurotrauma Symposium, Rotterdam, The Netherlands.

2003

- “Biomechanical Perspective on Low Energy Impacts Causing Serious Long Term Consequences,” 5<sup>th</sup> World Congress on Brain Injury, International Brain Injury Association, Stockholm, Sweden.
- “State-of-the-Art Biomechanical Issues In Relation to Mild Traumatic Brain Injury,” 5<sup>th</sup> World Congress on Brain Injury, International Brain Injury Association, Stockholm, Sweden.

2002

- “A Biomechanical Examination of Brain Dynamics As A Result of Minor Impacts,” 6<sup>th</sup> Congress of the European Federation of Neurological Societies, Vienna, Austria.

1996

- “Human Brain Modeling,” University of Cape Town, Department of Engineering, Rondebosch, South Africa as a part of the United States Engineering Education Delegation to the Republic of South Africa.
- “Human Brain Modeling,” University of Witswatersrand, Department of Engineering, Johannesburg, South Africa as a part of the United States Engineering Education Delegation to the Republic of South Africa.

### **UNITED STATES**

2011

- “Biomechanical Aspects of Brain Vulnerability,” Conference Sponsored by California Brain Injury Association, Napa, CA.
- “Simulation of Mechanical Properties of the Brain Matter under Creep-Recovery Tests,” North American Brain Injury Society 9<sup>th</sup> Annual Conference on Brain Injury, New Orleans, LA.
- “Helmet-Head Interactions under Ballistic Impacts – A Study on the Effects of Padding,” North American Brain Injury Society 9<sup>th</sup> Annual Conference on Brain Injury, New Orleans, LA.

2010

- “Mechanisms of Concussion and Blast Injuries,” North American Brain Injury Society and Alaska Brain Injury Network’s Alaska Brain Injury Conference, Anchorage, AK.

- “Effect of Brain Tissue Undulation on Mechanical Properties,” International Brain Injury Association 8<sup>th</sup> World Congress on Brain Injury, Washington, D.C.
- 2009
- “Understanding Biomechanical Phenomenon of mTBI in Wounded Soldiers,” National VHA/DoD Conference: Sensory Impairment Issues in Traumatic Brain Injury, Chicago IL
  - “Understanding Blast Related Brain Injuries Based on Macro-scale and Micro-scale Brain Tissue Modeling,” Blast Panel, North American Brain Injury Society, Brain Injury Conference of the Americas, Austin, TX.
  - “Micromechanics Application for Axonal Injury Analysis in Brain Tissue,” North American Brain Injury Society, Brain Injury Conference of the Americas, Austin, TX.
  - “Macro and Micro Scale Modeling for Understanding Blast Related Brain Injuries,” Traumatic Brain Injury: The Treatment Imperative, New York Academy of Traumatic Brain Injury 12<sup>th</sup> Annual Conference, New York, New York.
  - “Traumatic Brain Injury: A Biomechanical Perspective,” North Dakota State University Psychology Department Colloquium Series, Fargo, ND
- 2008
- “Blast Injuries – A Biomechanical Viewpoint,” California Brain Injury Association State of the Art Medical and Rehabilitative Care in Brain Injury: Clinical Implications, Napa, CA.
  - “Biomechanics of TBI: Biomechanical Perspective on Cavitation Inception as a New Brain Injury Mechanism,” Blast Brain Injuries: Military and Mining Conference, Brain Injury Association of West Virginia, South Charleston, WV.
  - “Physics of Blast Related mTBI,” Special Panel, Blast Injury Institute, North American Brain Injury Society, Brain Injury Conference of the Americas, New Orleans, LA.
  - “A Critical Review of Current Brain Injury Tolerances,” North American Brain Injury Society, Brain Injury Conference of the Americas, New Orleans, LA.
  - “Biomechanics of TBI: Biomechanical Perspective on Cavitation Inception as a New Brain Injury Mechanism,” Veteran’s Health Administration’s Visual Consequences of Traumatic Brain Injury Conference, Billerica, MA.
  - “Pattern of Brain Injury Caused by Blast,” The New York Academy of Traumatic Brain Injury, New York, NY.
  - “Physics of Blast Related Traumatic Brain Injury,” Traumatic Brain Injury Conference and Think Tank Session, College Station, TX.
- 2007
- “Physics of Blast Injury,” North American Brain Injury Society, Brain Injury Conference of the Americas, San Antonio TX, September.
  - “Finite Element-based Characterization of Blast-related Traumatic Brain Injury,” North American Brain Injury Society, Brain Injury Conference of the Americas, San Antonio TX.
  - “Brain Injury Due to Roof Crush,” Emergency World Summit, An American Auto Safety Tragedy: Roof Crush, Washington, DC.
  - “The Contribution of Biomechanical Factors Including Blast to Traumatic Brain Injury,” The New York Academy of Traumatic Brain Injury, New York, NY.
- 2006
- Ziejewski, M. M. Pietrzak, MD (Col. USAF, MC, ret), D. Warden, MD (National Director, Defense and Veterans Brain Injury Center, Walter Reed Army Medical Center), L. French, PhD (Chief of Clinical Services, Defense and Veterans Brain Injury Center, Walter Reed Army Medical Center), and G. Grant, MD (Assistant Professor of Neurosurgery, Department of Surgery, Division of Neurosurgery, Duke University Medical Center) “Panel Discussion: Blast Injuries and Traumatic Brain Injury,” North American Brain Injury Society, Brain Injury Conference of the Americas, Miami, FL.
  - Ziejewski, M. “Biomechanics of Mild TBI,” North American Brain Injury Society, Brain Injury Conference of the Americas, Miami, FL.
  - Abolfathi, N., M. Ziejewski and G. Karami. “Dynamic Analysis of a Living Cell for Multiscale Traumatic Brain Injury (TBI) Analysis,” Biomedical Engineering Society (BMES) Conference, Chicago.
  - Li, D., M. Ziejewski and G. Karami. “Parametric studies of Brain Materials in the Analysis of Head Impact,” ASME International Conference and Exhibition, Chicago.
  - Ziejewski, M., I. Akhatov, G. Karami, “Brain Injury Caused by Blasts – Nanofilm Dynamics of Cavitation,” Brain Injury Conference of the Americas, North American Brain Injury Society, Miami, FL
- 2005
- “Biomechanics of Traumatic Brain Injury – A Review,” and “The Biomechanical Assessment of Traumatic Brain Injury,” Spring 2005 Brain Injury Conference: “Biomechanics and Physiological Impact of Traumatic Brain Injury” and American Academy for the Certification of Brain Injury Specialists (AACBIS). Memphis, TN.
- 2004
- “Using ATB to Predict Mild Traumatic Brain Injury,” ATB Model Users’ Group Conference, Salt Lake City, UT.



- “Biomechanics of Brain Injury,” Fifth Annual Managing Challenging Situations in Brain Injury Care, Bethesda Rehabilitation Hospital, Minneapolis, MN.
  - “Biomechanical Evidence in Mild Brain Injury Case,” Brain Injury Association of Indiana, Indianapolis, IN.
  - “Biomechanics of TBI,” 17<sup>th</sup> Annual Conference on Medical & Legal Issues in Brain Injury, North American Brain Injury Society & International Brain Injury Association, Beaver Creek, CO.
- 2003
- “The Biomechanics of Brain Injury,” The Brain Injury Association of New York State, New York, NY.
  - “The Biomechanics of Brain Injury,” Brain Injury Association of America, Napa Valley, CA.
  - “State-of-the-Art Biomechanical Issues in Relation to Mild Traumatic Brain Injury,” North American Brain Injury Society Conference, Amelia Island, FL.
  - “The Mechanism of Traumatic Brain Injury,” Brain Injury Association of Utah, Salt Lake City, UT.
- 2002
- “Biomechanics of Traumatic Brain Injury-Identification of Patients at Risk of MTBI in ER Setting Using Biomechanical Analysis,” Fourth Annual Brain Injury Association of America, Napa Valley, CA.
  - “Selected Sources for Head Impact Kinematics Useful for Validation of ATB Results,” ATB Model Users’ Group Conference sponsored by the US Air Force Research Laboratory, Patuxent Naval Air Station, Patuxent River, MD.
- 2001
- Case Specific Visualization and Assessment of Biomechanical Brain Modeling Based on MRI Data,” Brain Injury Association of California, Napa Valley, CA.
  - “A Biomechanical Examination of the Efficacy of Soccer Protective Headgear in Reducing Trauma to the Head from Low Impacts,” The Brain Injury Association’s, 20<sup>th</sup> Annual Symposium, Atlanta, GA.
- 2000
- “The Mechanism of Concussion,” Sports Related Concussions Workshop, ASTM Subcommittee F08.51 on Medical Aspects and Biomechanics, Orlando, FL.
  - “Biomechanical Issues Related to Reduction of Trauma to the Brain from Unanticipated Low Impacts in Soccer,” Chairman’s Roundtable Discussion on Head Injury and Youth Sports, United States Consumer Products Safety Commission, Washington, D.C.
  - “The Biomechanics of Traumatic Brain Injury,” The Brain Injury Association of New York State, New York, NY.
  - “ATB Simulation vs. Experimental Data for Hybrid III Head and Neck in Frontal Impacts,” ATB Users’ Group Conference sponsored by US Air Force Research Laboratory, Wichita, KS.
  - New NHTSA Standards and Injury Requirements for Biomechanics of Brain Injury for Model Year 2003-2005 Vehicles, Brain Injury Association of California, Napa Valley, CA.
- 1999
- “Biomechanical Perspective of Neuronal Damage Due to Brain Deformation,” Brain Injury Conference, Bancroft NeuroHealth, Philadelphia, PA.
- 1998
- “Human Head/Neck Response Modes for Vertical Impact,” NATO/RTO Specialist Meeting, Dayton, OH.
  - “Generation of Integrated Skull-Brain Model,” 5<sup>th</sup> International LS-DYNA Users Conference, Detroit, MI.
  - “Assessment of Brain Injury Potential in Design Process of Children’s Helmet Using Articulate Total Body and Finite Element Modeling,” ATB Model Users’ Group Conference sponsored by US Air Force Armstrong Laboratory, Dayton, OH.
- 1997
- “ATB Deformable Neck Option for +Gz Acceleration,” ATB Model Users’ Group Conference, Charlottesville, VA.
- 1996
- Human Brain Modeling,” University of Pretoria, Department of Engineering, Pretoria, South Africa as a part of the United States Engineering Education Delegation to the Republic of South Africa.
  - “Application of Ellipses, Ellipsoids, and Hyperellipsoids in Computer Modeling of Human Body and Interior Surfaces,” 1996 ATB Model Users’ Group Conference sponsored by US Air Force Armstrong Laboratory, Phoenix, AZ.
  - “3-D Animation Generated from ATB Output,” 1996 ATB Model Users’ Group Conference sponsored by US Air Force Armstrong Laboratory, Phoenix, AZ.
- 1992
- “Design Modifications for Durability Improvements For Diesel Engines Operating on Plant Oil Fuels,” International SAE Meeting, Milwaukee, WI.
  - “Comparative Analysis of the Exhaust Emissions from Vegetable Oil Based Alternative Fuels,” International SAE Congress, Detroit, MI.
  - “Alternative Fuels for Diesel Engines,” 8th SSTS Seminar, Fargo, ND.

- 1991
- “Development of an Infrared Method for Ignition Delay Measurements,” International SAE Congress, Detroit, MI.
- 1989
- “Duel-Air Injection Nozzle for Diesel Engines,” International SAE Off-Highway Meeting, Milwaukee, WI.
  - “A Quantitative Analysis for a Slurry Centrifugal Pump,” International SAE Off-Highway Meeting, Milwaukee, WI.
  - “Discharge Coefficients for Flow-Through Multi-hole Fuel Injection Nozzle for Alternate Fuels,” International Fuels and Lubricants Meeting, Portland, OR.
- 1988
- “Simultaneous Test Procedure Approach to Alternate Fuels Performance Evaluation,” International SAE Off-Highway Meeting, Milwaukee, WI.
  - “Numerical Optimization Approach to the Design of a Diesel Engine Fuel Injection Nozzle,” International SAE Congress, Detroit, MI.
- 1987
- “Lubricant Performance and Turbochargers Analysis for Alternate Fuel Tests,” International SAE Off-Highway Meeting, Milwaukee, WI.
- 1986
- Analysis of the Diesel Engine Performance Using the Statistical Analysis System Software,” International Fuels and Lubricants Meeting, Philadelphia, PA.
  - “Influence of Vegetable Oil Based Alternate Fuels on Residue Deposits and Components Wear in Diesel Engine,” International SAE Congress, Detroit, MI.
  - “Comparative Analysis of the Long Term Diesel Engine Performance on Vegetable Oil Based Alternate Fuels,” International SAE Congress, Detroit, MI.
- 1985
- “Statistical Aspects of Testing Alternate Fuels,” International Fuels and Lubricants Meeting, Tulsa, OK.
  - “Performance of a Diesel Engine Operating on Blend of Diesel Fuel and Crude Sunflower Oil at Normal and Elevated Fuel Temperatures,” International Fuels and Lubricants Meeting, Tulsa, OK.
  - “Statistical Aspects of Testing Alternate Fuels,” International Fuels and Lubricants Meeting, Tulsa, OK.

## CURRICULUM DEVELOPMENT

- ME 743, “Biomechanics of Impact”
- ME 793-01 Neuroscience I: Neuronal Cell Biology & Sensory Systems  
Collaboration with UND School of Medicine (Anatomy 522)
- ME 793-02 Neuroscience I: Motor Systems & Higher Functions  
Collaboration with UND School of Medicine (Anatomy 522)
- ME 496/696 “Fundamentals of Vehicle Dynamics.”
- Developed laboratory (8 experiments) for ME 496/696 course “Fundamentals of Vehicle Dynamics.”  
Development included: experimental setup of the experiment, experiment and data evaluation procedures, annotated bibliography of current related literature and reference list.

## AWARDS

- Received *Member Service Award* from SAE in recognition of 25 years of active membership with SAE International (2007).
- Received *Merit Certificate of Recognition* from the US National Committee on Biomechanics for the poster presentation, “A Telemedical Approach to Using Brain Biomechanics in Emergency Department” at *The Second US National Symposium on Frontiers in Biomechanics* (2005).
- Selected for Summer Research Program in Occupant Biodynamics Modeling at the Armstrong Laboratory at Wright-Patterson Air Force Base, OH (1997)
- United States Air Force Office of Scientific Research Award  
Selected for Summer Research Program in Occupant Biodynamics Modeling at the Armstrong Laboratory at Wright-Patterson Air Force Base, OH (1996)
- College of Engineering & Architecture Researcher of the Year Award, North Dakota State University, Fargo, ND (1992)
- Polish Government Scholarship for Research and Education at Foreign Universities.

Selected by the Polish Academy of Science on behalf of the Polish government, with fourteen other researchers, for research in a foreign country. The selection was made based on the national screening procedure including professional examinations and interviews. (1979)

6/25/2012