

JOSEPH DAVID PELES

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Tempe, Arizona 85281
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EDUCATION:

- Ph.D. **Arizona State University**, Tempe, AZ, May 1996 (Bioengineering)
Dissertation: "Spinal Stability and Mechanism of Injury Analysis Through Experimental Testing and Computer Modeling."
- M.S. **Arizona State University**, Tempe, AZ, December 1990 (Bioengineering)
Thesis: "Relations Between Neck Muscle Activity and Three Dimensional Head Kinematics During Natural Head Tracking Movements."
- B.E. **Vanderbilt University**, Nashville, TN, May 1988 (Biomedical/Electrical Engineering)
- Additional Coursework **Northwestern University Traffic Institute**, Evanston, IL
Traffic Accident Reconstruction I & II (January, 1992)

ACCREDITATION:

ACTAR, Accreditation Commission for Traffic Accident Reconstruction (July 13, 2000, Accreditation #1133)

AREAS OF RESEARCH:

Spinal Biomechanics: Intervertebral disc herniations, cadaver testing of the cervical and lumbar spine, dynamic/solid computer modeling of the cervical spine, mechanism of injury for cervical lesions, muscle activity and cervical kinematics during head movements, diagnosis of cervical soft tissue injuries, cervical instabilities and the effect of orthotic fixation.

Low Velocity Impacts: Vehicle-to-vehicle rear-end, frontal and side impact testing with human volunteers. Data collection for vehicle damage, vehicle dynamics, occupant motion, muscle activity and potential for injury.

Restraint Systems: Development of a child restraint system for use in pick-up beds. Mechanical testing of restraint systems to determine stretch and retractor spool out properties.

POSITIONS HELD:

- 2/97 - present **Arizona State University**, Tempe, AZ
Adjunct Professor: Chemical, Bio & Materials Engineering Department
Courses Taught: Orthopedic and Trauma Biomechanics (1997 – 1999, 2001)
Topics in Biomechanics (1998)
Masters Thesis Supervision: Spinal Biomechanics (1997 - 1999)
Faculty Judge: Fulton Minority Engineering Program, Second Annual Technical Paper Competition (April 2006)
12TH Annual Biomedical Engineering Day, Poster Session (April 2006)
14th Annual Biomedical Engineering Senior Capstone Design Poster Session (April 2008)
Research Advisor/Mentor: Capstone Senior Design Projects (2007-)
- 1/92 - present **Biomechanics Research & Consulting, Inc.**, Tempe, AZ
President.
Injury Biomechanics Consultant and Accident Reconstructionist

Positions Held (continued):

- 5/89 - 12/91 **Bio-Impact Analysis**, Phoenix, AZ
Injury Biomechanics Consultant
- 5/91 - 10/91 **Whiplash Analysis, Inc.**, Phoenix, AZ
Cervical Biomechanics Consultant and Computer Programmer
- 8/88 - 5/91 **Arizona State University**, Tempe, AZ
Research Assistant, Biomechanics Laboratory
Teaching Assistant, Bio-Instrumentation Laboratory

HONORS:

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|-------------|---|----------------------------|
| 4/91 | The Honor Society of Phi Kappa Phi | (Arizona State University) |
| 8/88 - 5/89 | Graduate Academic Scholarship | (Arizona State University) |
| 5/88 | Graduated Magna Cum Laude | (Vanderbilt University) |
| 1/87 | Tau Beta Pi Engineering Honor Society | (Vanderbilt University) |
| 5/86 | Gamma Beta Phi Service Honor Society | (Vanderbilt University) |
| 5/85 | Alpha Lambda Delta National Honor Society | (Vanderbilt University) |
| 5/85 | Phi Eta Sigma National Honor Society | (Vanderbilt University) |

SPONSORED RESEARCH PROJECTS:

As a Co-Investigator:

Yamaguchi GT and Peles JD, "Development of a Three-Dimensional Dynamic/Solid Computer Model of a Cervical Functional Spinal Unit", Barrow Neurological Institute and the National Science Foundation, \$10,000, (8/93 to 5/94).

As a Research Assistant:

Winters JM, "Biomechanical Considerations in the Design and Utilization of Halos", Arizona State University, (10/89 to 12/90).

Winters JM, "Human Head-Neck Movements: Initiating an Extensive Study", Arizona State University, (1/89 to 11/89).

Graduate Student Committee Membership:

Taylor, SB, "Lumbar spinal injury: an in vitro study using flexibility testing and magnetic resonance imaging." Thesis-M.S., Arizona State University (1999).

DESIGN PROJECTS:

As a Research Advisor/Mentor for the Arizona State University Capstone Senior Design Projects:

Universal Hand Cycle for Malawian Wheelchairs, Brunet, R, Chavarria, J, Loud, D (2009-2010)

Soccer Kick Therapy for Malawian Cerebral Palsy Patient, Orosco, C, Gavan, K, (2008-2009)

An Improved Hand-Cycle for Anthony; Hoy, A, Jindal, R and Sarder, F (2007-2008).

Retractable Leg Rest on Standardized Wheel Chair; Higgins, A (2007-2008).

A Customized Kick Scooter for Zomba Boy, Proposed Therapeutic Device for Children Affected with Cerebral Palsy (Hemi Paresis); Das, S (2007-2008).

PUBLICATIONS:

Archival Refereed Journal Papers:

Peles JD, Oleson LM and Belanger AG: Steering wheel “jerk”: A unique injury mechanism during certain sideswipe accidents. *Accident Reconstruction Journal* V. 20, n. 3., pp. 25-28, 2010

Crawford NR, Peles JD and Dickman CA: The spinal lax zone and neutral zone: Measurement techniques and parameter comparison. *The Journal of Spinal Disorders*, V. 11, n. 5., pp. 416-429, 1998.

Winters JM, Peles JD, Osterbauer PJ, Derickson KL, Deboer KF and Fuhr AW: Three-dimensional head axis of rotation during tracking movements: A tool for assessing neck neuromechanical function. *Spine* V. 18, n. 9, pp. 1178-1185, 1993.

Book Chapters:

Winters JM and Peles JD: Neck muscle activity and 3-D head kinematics during quasi-static and dynamic tracking movements. Chapter 28. Multiple Muscle Systems. (ed. Winters JM and Woo SL-Y), Springer-Verlag, 1990.

Refereed National Conference Proceedings:

Peles JD, Crawford NR, Sonntag VKH, Dickman CA and Yamaguchi GT: Helical axis patterns for intact and destabilized cervical spine segments. *Proceedings of the 21st Annual American Society of Biomechanics Meeting*, Clemson, SC, 1997.

Peles JD, Winters JM and Hurley TR: Directional and spatial sensitivity of neck muscle activity during comfortably paced 3-D head tracking movements. *Proceedings of the 14th Annual American Society of Biomechanics Meeting*, Miami, FL, 1990.

Winters JM, Peles JD, Derickson KL, Osterbauer PJ and Fuhr AW: Head finite screw axis parameters during vertical, horizontal and oblique tracking movements: Normal and injured subjects. *Proceedings of the 14th Annual American Society of Biomechanics Meeting*, Miami, FL, 1990.

Abstracts:

Crawford NR, Peles JD and Dickman CA: Quantifying the spinal neutral zones: The effect of preload. *Proceedings of the 13th Annual Meeting of The American Association of Neurological Surgeons and The Congress of Neurological Surgeons*, Newport Beach, CA, 1997.

Peles JD and Winters JM: Organization of neck muscle activity for quasi-static and dynamic 3-D head tracking movements. *Proceedings of the 1st World Congress of Biomechanics*, San Diego, CA, 1990.

Winters JM, Peles JD, Derickson KL, Daru KR, Osterbauer PJ and Fuhr AW: Relations between neck muscle activity and screw axis parameters of the head. *Proceedings of the 1st World Congress of Biomechanics*, San Diego, CA, 1990.

PRESENTATIONS:

Peles JD: Accident reconstruction and biomechanics. (presented at New Laws, Old Ethics and Accident Reconstruction), Northern Arizona Public Defenders Office, Flagstaff, AZ, May 2, 1998.

Peles JD: Biomechanics of the seat belt defense. (presented at the East Valley Bar Association Luncheon, Mesa, Arizona), January 20, 1995.

Peles JD: The role of biomechanics in legal cases. (presented at the Arizona Paralegal Association Monthly Luncheon), November 8, 1994.

Presentations (continued):

Peles JD: Session Chairman: Rehabilitation Engineering I: Anthropomorphic and Biodynamic Models, *Annual Fall Meeting of the Biomedical Engineering Society*, Arizona State University, October 14-16, 1994.

Peles JD: The use of bioengineering technology by the personal injury lawyer (presented at Simulation, Animation & Other Useful Tools for P.I. Litigation), State Bar of Arizona, Continued Legal Education, June 3, 1994.

Peles JD: Biomechanical issues affecting the personal injury lawyer (presented at Motor Vehicle Accident Cases: Effective Prosecution and Defense), State Bar of Arizona, Continued Legal Education, May 20, 1994.

CONTINUED EDUCATION:

ARC-CSI Crash Conference, Accident Reconstruction Network and the Collision Safety Institute (2010)

ARC-CSI Crash Conference, Accident Reconstruction Network and the Collision Safety Institute (2008)

MapScenes User Conference (2005)

Automotive Seat Design for Safety TOPTEC, Society of Automotive Engineers, Marina Del Rey, CA (1995).

Low Speed Rear Impact Collision TOPTEC, Society of Automotive Engineers, Newport Beach, CA (1994).

Analytical Reconstruction of Automobile Crashes Using a 3-D Simulator, Society of Automotive Engineers, Scottsdale, AZ (1994).

Head and Neck Injury Symposium, Society of Automotive Engineers, Denver, CO (1993).

Vehicle Rollovers TOPTEC, Society of Automotive Engineers, Phoenix, AZ (1992).

PROFESSIONAL AFFILIATIONS:

Society of Automotive Engineers

American Society of Biomechanics

National Association of Professional Accident Reconstruction Specialists

Southwestern Association of Technical Accident Investigators

Biomedical Engineering Society