Hana Chan Ph.D.

Staff Consultant

Dr. Hana Chan is a Staff Consultant at Engineering Systems Inc. (ESi) in the Aurora, Illinois office. Dr. Chan specializes in biomechanical analysis, injury biomechanics, and automotive safety. She has research experience in human volunteer testing, motion capture systems, surface electromyography, and anthropomorphic test device testing. She also has experience in mechanical testing and soft tissue biomechanics. At ESi, Dr. Chan applies her expertise to a range of investigative scenarios, including motor vehicle accidents, injury causation, accident reconstruction, safety analyses, product and premises liability claims, and slips, trips, and falls.

Prior to joining ESi, Dr. Chan earned a Ph.D. in Biomedical Engineering from the Virginia Tech – Wake Forest University School of Biomedical Engineering and Sciences where she conducted research at the Center for Injury Biomechanics. For her dissertation research, Dr. Chan quantified the occupant responses of relaxed and braced small female and mid-size male human volunteers during low-speed frontal and frontal-oblique sled tests.

Dr. Chan has presented her research at international conferences and is published in peer-reviewed scientific journals and conference proceedings, including the *SAE International Journal of Transportation Safety and International Research Council on Biomechanics of Injury*.

Positions Held

Engineering Systems Inc., Aurora, Illinois

- Staff Consultant, 2023- Present

Virginia Tech, Blacksburg, Virginia

- Graduate Research Assistant, Center for Injury Biomechanics, 2018-2023
- Undergraduate Research Assistant, Orthopedic Mechanobiology Laboratory, 2016-2017

Case Western Reserve University, Cleveland, Ohio

- Lead Undergraduate Teaching Assistant, Department of Biomedical Engineering, 2018

Publications and Presentations

Journal Publications

1. **Chan H**, Albert DL, Gayzik FS, Kemper AR. (2023) “Occupant Kinetics and Muscle Responses of Relaxed and Braced Small Female and Mid-Size Male Volunteers in Low-Speed Frontal Sled Tests.” *SAE International Journal of Transportation Safety*, 11(3).

Hana Chan, Ph.D.
Staff Consultant

Email: hchan@engsys.com
Phone: 630-851-2875

ESi Aurora
4215 Campus Dr.
Aurora, IL 60504

Education
Ph.D., Biomedical Engineering, Virginia Tech- Wake Forest University
B.S.E., Biomedical Engineering, Case Western Reserve University

Areas of Specialization
Occupant Kinematics
Human Injury Analysis
Injury Causation
Injury Mechanisms
Impact Biomechanics
Slips, Trips, and Falls
Automotive Safety
Occupant Protection
Restraints/Seatbelts/Airbags
Pre-Crash Events
Low-Speed Impacts
Accident Reconstruction
Experimental Testing
Human Volunteer Testing
Motion Capture Systems
Surface Electromyography
Biomedical Instrumentation
Data Acquisition and Analysis

2. Chan H**, Albert DL, Gayzik FS, Kemper AR. (2021) "Assessment of Acclimation of 5th Percentile Female and 50th Percentile Male Volunteer Kinematics in Low-Speed Frontal and Frontal-Oblique Sled Tests."** ***SAE International Journal of Transportation Safety*****, 9(1): 3-103.**

Conference Proceedings

1. Mathias AC, Hazime GA, **Chan H**, Roberts JM, Kelley ME. (2025) "Elevator Passenger Accelerations during Emergency Stops, Normal Elevator Travel, and Everyday Activities." *Rocky Mountain Bioengineering Symposium, Biomedical Sciences Instrumentation,* 61(1): 23-32.
2. Albert DL, **Chan H**, Gayzik FS, Kemper AR. (2024) "Comparison of THOR-AV and Volunteer Kinematics during Low-Speed Frontal and Frontal-Oblique Sled Tests." *International Research Council on Biomechanics of Injury Conference*.
3. Devane KS, **Chan H**, Albert DL, Kemper AR, Gayzik FS. (2024) "Active Human Body Models for Capturing Variability in Occupant Bracing in Pre-Crash Braking and Low-Speed Impact Events." *International Research Council on Biomechanics of Injury Conference*.
4. Albert DL, **Chan H**, Gayzik FS, Kemper AR. (2023) "Volunteer Bracing Strategies and Variability before Low-Speed Frontal and Frontal-Oblique Sled Tests." *International Research Council on Biomechanics of Injury Conference.*
5. Devane KS, **Chan H**, Albert DL, Kemper AR, Gayzik FS. (2023) "Response of Small Female and Midsize Male Models with Active Musculature in Pre-Crash Manoeuvres and Low-Speed Impacts." *International Technical Conference on the Enhanced Safety of Vehicles, Traffic Injury Prevention,* 24 (sup1): S9-S15.
6. Devane KS, **Chan H**, Albert DL, Kemper AR, Gayzik FS. (2022) "Implementation and Calibration of Active Small Female and Average Male Human Body Models using Low-Speed Frontal Sled Tests." *Association for the Advancement of Automotive Medicine Annual Conference, Traffic Injury Prevention,* 23 (sup1): S44-S49.
7. **Chan H**, Albert DL, Gayzik FS, Kemper AR. (2022) "Occupant Kinematics of Braced 5th Percentile Female and 50th Percentile Male Volunteers in Low-Speed Frontal and Frontal-Oblique Sled Tests." *International Research Council on Biomechanics of Injury Conference.*
8. **Chan H**, Devane KS, Albert DL, Gayzik FS, Kemper AR. (2021) "Comparisons of Initial Joint Angles and Test Buck Reaction Forces for Relaxed and Braced 5th Female and 50th Male Volunteers and Analogous Active Human Body Models in a Simulated Driver's Seat." *International Research Council on Biomechanics of Injury Conference*.

Conference Presentations

1. Mathias AC, Hazime GA, **Chan H**, Roberts JM, Kelley ME. (2025) "Elevator Passenger Accelerations during Emergency Stops, Normal Elevator Travel, and Everyday Activities." *International Biomedical Sciences Instrumentation Symposium & Rocky Mountain Bioengineering Symposium*, April 11-12, St. George, Utah.
2. Albert DL, **Chan H**, Gayzik FS, Kemper AR. (2024) "Comparison of THOR-AV and Volunteer Kinematics during Low-Speed Frontal and Frontal-Oblique Sled Tests." *International Research Council on Biomechanics of Injury Conference*, September 11-13, Stockholm, Sweden.
3. Devane KS, **Chan H**, Albert DL, Kemper AR, Gayzik FS. (2024) "Active Human Body Models for Capturing Variability in Occupant Bracing in Pre-Crash Braking and Low-Speed Impact Events." *International Research Council on Biomechanics of Injury Conference*, September 11-13, Stockholm, Sweden.
4. Albert DL, **Chan H**, Gayzik FS, Kemper AR. (2023) "Volunteer Bracing Strategies and Variability before Low-Speed Frontal and Frontal-Oblique Sled Tests." *International Research Council on Biomechanics of Injury Conference*, September 13-15, Cambridge, United Kingdom.
5. **Chan H**, Albert DL, Gayzik FS, Kemper AR. (2023) "Occupant Kinetics and Muscle Responses of Relaxed and Braced Small Female and Mid-Size Male Volunteers in Low-Speed Frontal Sled Tests." *SAE World Congress Experience*, April 18-20, Detroit, Michigan.
6. Devane KS, **Chan H**, Albert DL, Kemper AR, Gayzik FS. (2023) "Response of Small Female and Midsize Male Models with Active Musculature in Pre-Crash Manoeuvres and Low-Speed Impacts." *International Technical Conference on the Enhanced Safety of Vehicles*, April 3-6, Yokohama, Japan.

7. Devane KS, **Chan H**, Albert DL, Kemper AR, Gayzik FS. (2022) "Implementation and Calibration of Active Small Female and Average Male Human Body Models using Low-Speed Frontal Sled Tests." *Association for the Advancement of Automotive Medicine Annual Conference*, October 11-14, Portland, Oregon.
8. **Chan H**, Albert DL, Gayzik FS, Kemper AR. (2022) "Occupant Kinematics of Braced 5th Percentile Female and 50th Percentile Male Volunteers in Low-Speed Frontal and Frontal-Oblique Sled Tests." *International Research Council on Biomechanics of Injury Conference*, September 14-16, Porto, Portugal.
9. **Chan H**, Albert DL, Gayzik FS, Kemper AR. (2022) "Comparison of the THOR-AV-5F ATD and 5th Percentile Female Volunteer Responses during Low-Speed Frontal and Frontal-Oblique Sled Tests." *Ohio State University Injury Biomechanics Symposium*, May 23-24, Columbus, Ohio.
10. **Chan H**, Albert DL, Gayzik FS, Kemper AR. (2022) "Quantifying the Occupant Response of Relaxed and Braced 5th Percentile Female and 50th Percentile Male Volunteers during Low-Speed Frontal and Frontal-Oblique Sled Tests." *SAE Government Industry Meeting*, January 18-20, Washington, District of Columbia.
11. **Chan H**, Albert DL, Gayzik FS, and Kemper AR. (2021) "Pre-Impact Bracing Variability in 5th Percentile Female and 50th Percentile Male Volunteers Prior to Low-Speed Frontal and Frontal-Oblique Sled Tests." *National Highway Traffic Safety Administration Workshop on Human Subjects for Biomechanical Research*, October 26-27, virtual.
12. **Chan H**, Devane KS, Albert DL, Gayzik FS, Kemper AR. (2021) "Comparisons of Initial Joint Angles and Test Buck Reaction Forces for Relaxed and Braced 5th Female and 50th Male Volunteers and Analogous Active Human Body Models in a Simulated Driver's Seat." *International Research Council on Biomechanics of Injury*, September 8-10, virtual.
13. **Chan H**, Albert DL, Gayzik FS, Kemper AR. (2020) "Female and Male Volunteer Kinematics during Relaxed and Braced Pre-Crash Braking Events." *Association for the Advancement of Automotive Medicine Student Symposium*, October 12, virtual.
14. Devane KS, **Chan H**, Albert DL, Kemper AR, Gayzik FS. (2020) "Development and Validation of an Active Small Female and Average Male Human Body Model for Predicting Head Kinematics in Pre-Crash Braking and Low-Speed Frontal Sled Tests." *Association for the Advancement of Automotive Medicine Student Symposium*, October 12, virtual.

15. Chan H, Albert DL, Kemper AR. (2019) "Effects of Pre-Impact Bracing on Human Occupant Kinematics during Low-Speed Frontal Sled Tests." *Biomedical Engineering Society Annual Meeting*, October 16-19, Philadelphia, Pennsylvania.

Continuing Education

- **Walkway Auditor Certificate Holder**- National Floor Safety Institute, Norcross, GA, 2024
- **Traffic Crash Reconstruction for Engineers**- Northwestern University Center for Public Safety Aurora, IL, 2024

Professional Affiliations/Honors

Professional Affiliations & Honors

Association for the Advancement of Automotive Medicine (AAAM)
Biomedical Engineering Society (BMES)
Society of Automotive Engineers (SAE)
Women's Transportation Seminar (WTS)

Honors

Association for the Advancement of Automotive Medicine (AAAM)

Best Student Symposium Presentation, 2020

International Research Council on Biomechanics of Injury (IRCOBI)

Travel Grant, 2022

Best Conference Presentation, 2021

Virginia Tech Graduate School

Joseph Frank Hunkler Memorial Fellowship, 2022

Travel Fund Program Grant, 2022