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HANA CHAN, PH.D.
STAFF CONSULTANT

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Dr. Hana Chan is a Staff Consultant at Engineering Systems, Inc. (ESi) in the Aurora, Illinois office. Dr. Chan specializes in 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.

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*.

Areas of Specialization

Automotive Safety
Occupant Protection
Impact Biomechanics
Experimental Testing
Occupant Kinematics
Low-Speed Impacts
Pre-Crash Events
Motion Analysis
Human Injury Analysis
Human Volunteer Testing
Surface Electromyography
Biomedical Instrumentation

Education

Ph.D., Biomedical Engineering, Virginia Tech, 2023
B.S.E., Biomedical Engineering, Case Western Reserve University, 2018

Professional Affiliations & Honors

Professional Affiliations and Reviewer Activities:

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

Honors and Awards:

Association for the Advancement of Automotive Medicine
Best Student Symposium Presentation, 2020
International Research Council on Biomechanics of Injury
Travel Grant, 2022
Best Conference Presentation, 2021
Virginia Tech Graduate School
Joseph Frank Hunkler Memorial Fellowship, 2022
Travel Fund Program Grant, 2022

October 2023

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 & 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).

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. 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.*

2. 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.

3. 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.

4. **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.*

5. **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. 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.

2. **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.

3. 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.

4. 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.

5. **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.

6. **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.

7. **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.

8. **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.

9. **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.

10. **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.

11. 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.

12. **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.