15235 Alton Parkway, Suite 120
Irvine, CA 921618

JOOST OP ‘T EYNDE, Ph.D.
STAFF CONSULTANT
joopteynde@engsys.com

Dr. Joost Op ‘t Eynde is a biomedical and mechanical engineer at Engineering Systems Inc. (ESi) in the Irvine, California, office. Dr. Op ‘t Eynde has related expertise in blunt impact trauma, body armor and helmet systems, spine injury biomechanics, blast injury biomechanics, injury risk development, injury detection, and biomechanical experimental testing (cadaver, anthropometric test device, and animal).

Prior to joining ESi, Dr. Op ‘t Eynde earned a Ph.D. and M.S. in Biomedical Engineering from Duke University while conducting research in the Injury Biomechanics Laboratory. For his dissertation research, Dr. Op ‘t Eynde investigated injury risks and mechanisms related to behind armor blunt trauma. He also has extensive research experience in spine injury biomechanics, personal protective equipment for blast and blunt impact, blast neurotrauma, viscoelastic material properties, acoustic injury detection, biomechanical scaling, and injury mechanisms.

Dr. Op ‘t Eynde has presented his engineering research at international conferences and is published in peer-reviewed journals and conference proceedings, including *PLOS One, International Research Council on Biomechanics of Injury,* and *Personal Armour Systems Symposium.*

Areas of Specialization

Acoustic Emissions
Behind Armor Blunt Trauma
Biological Material Properties
Blast Biomechanics
Helmet Protection
Diagnostic Imaging
Failure Analysis
Fatigue Loading
Human Injury Analysis
Torso Injury
Impact Biomechanics
Injury Mechanisms
Injury Risk Curves
Lumbar Spine Injury
Shock Waves
Viscoelastic Modeling

Education

Ph. D., Biomedical Engineering, Duke University, 2023
M.S., Biomedical Engineering, Duke University, 2016
B.S., Engineering (Mechanical/Electrical), Katholieke Universiteit Leuven, 2015

Positions Held

Engineering Systems Inc., Irvine, California, United States
Staff Consultant, 2024 – Present

Duke University, Durham, North Carolina, United States
Research Associate, 2016 – 2017

Chiro Koersel, Beringen, Belgium
Youth Leader Volunteer, 2011 – 2016

Groen, Brussels, Belgium
Administrative Assistant, 2012

Professional Affiliations/Honors

Belgian American Educational Foundation Fellow, 2015
Blast Injury Conference, London, United Kingdom
Best Poster Award, 2021
IRCOBI Conference
Travel Grant 2018, Athens, Greece
Travel Grant 2019, Florence, Italy
Injury Biomechanics Symposium, Ohio State University
Travel Grant 2018
Travel Grant 2019
Travel Grant 2021

Languages

Dutch, Native
French, Conversational

Teaching Experience

Biomechanical Aspects of Blasts and Ballistics
Viscoelastic Biomechanics

Publications & Presentations

Journal Publications

Op ‘t Eynde J, Yu AW, Eckersley CP, Bass, CR. “Primary blast wave protection in combat helmet design: A historical comparison between present day and World War I.” *PLOS ONE*, 2020.

Ortiz-Paparoni MA, **Op ‘t Eynde J**, Eckersley CP, Morino CF, Abrams MZ, Pang DY, Kait JR, Pintar FA, Yoganandan N, Moore J, Barnes DR, Loftis KL, Bass CR. “Expanded Combined Loading Injury Criterion for the Human Lumbar Spine Under Dynamic Compression.” *Annals of Biomedical Engineering.* 2024.

Morino CF, Schmidt AL, Dimbath ED, Middleton ST, Shridharani JK, Kait JR, Ortiz-Paparoni MA, Klinger J, **Op ‘t Eynde J**, Bass CR. “Human and porcine lumbar endplate injury risk in repeated flexion-compression.” *Annals of Biomedical Engineering.* 2024.

Morino CF, Middleton ST, **Op ‘t Eynde J**, Dimbath ED, Kait JR, Luck JF, Bass CR. “Primary creep characterization in porcine lumbar spine subject to repeated loading.” *Annals of Biomedical Engineering*. 2024.

Ortiz-Paparoni MA, Morino CF, Bercaw J, **Op ‘t Eynde J**, Nightingale RW, Bass CR. “Translating cadaveric injury risk to dummy injury risk at iso-energy.” *Annals of Biomedical Engineering*. 2024.

Ortiz-Paparoni MA, **Op ’t Eynde J**, Kait JR, Bigler BR, Shridharani JK, Schmidt AL, Cox CA, Morino CF, Pintar FA, Yoganandan N, Moore J, Zhang J, Bass CR. “The human lumbar spine during high-rate under seat loading: a combined metric injury criteria.” *Annals of Biomedical Engineering*. 2021.

Shridharani JK, Ortiz-Paparoni MA, **Op ‘t Eynde J**, Bass CR. “Acoustic emissions in vertebral cortical shell failure.” *Annals of Biomedical Engineering*. 2021.

Eckersley CP, **Op ‘t Eynde J**, Abrams MZ, Bass CR. “Using wavelet analysis to distinguish cavitation acoustic emissions from blunt impact noise.” *Journal of Biomechanical Engineering*. 2021.

Refereed Conference Publications

Op ‘t Eynde J, Shah AS, McMahon JA, Pang DY, Stemper B, Yoganandan N, Salzar RS, McEntire BJ, Bass CR (2023). “Scaling animal to human injury response for use in improved behind armor blunt trauma injury criteria.” *Personal Armour Systems Symposium*.

Op ‘t Eynde J, Pang DY, Morino CF, Abrams MZ, Kait JR, Salzar RS, Bentley TB, Shender BS, Bass CR (2023). “The fundamental limitations of clay for assessing human response for behind armor blunt trauma.” *Personal Armour Systems Symposium*.

Op ‘t Eynde J, Eckersley CP, Salzar RS, Stemper BD, Shender BS, Bentley TB, Bass CR (2020). “Behind armour blunt trauma indenter simulating high-velocity impacts from rifle rounds on hard body armour.” *Personal Armour Systems Symposium*.

Op ‘t Eynde J, Eckersley CP, Bass CR (2019). “High-rate viscoelastic shear model of porcine skin, lung, and liver tissue.” *International Research Council on Biomechanics of Injury*.

Op ‘t Eynde J, Yu AW, Eckersley CP, Bass CR (2018). “The lessons of history: helmets and primary blast.” *Personal Armour Systems Symposium*.

Op ‘t Eynde J, Ortiz-Paparoni MA, Lucas SR, Bass CR (2018). “Novel fractional viscoelastic model of ligaments for high strain rates.” *International Research Council on Biomechanics of Injury*.

McMahon JA, Berthelson PR, Salzar RS, Shah A, **Op ‘t Eynde J**, McEntire JB (2023). “Development of impulse-based rib fracture injury criterion for behind armor blunt trauma.” *International Research Council on Biomechanics of Injury*.

Shah AS, McMahon JA, **Op ‘t Eynde J**, Salzar RS, Johnson B, McEntire JB (2023). “Data filtering for the analysis of biological tests for behind armor blunt trauma studies.” *Personal Armour Systems Symposium*.

McMahon JA, Berthelson PR, Salzar RS, Shah AS, **Op ‘t Eynde J**, McEntire JB (2023). “Development of impulse-based rib fracture injury criterion for behind armor blunt trauma.” *International Research Council on Biomechanics of Injury*.

Morino CF, Schmidt AL, Dimbath ED, Middleton ST, Kait JR, Shridharani JK, Ortiz-Paparoni MA, Klinger J, **Op ‘t Eynde J**, Bass CR. (2023). “Human and porcine lumbar endplate injury risk in repeated flexion-compression.” *International Research Council on Biomechanics of Injury*.

Morino CF, Middleton ST, Dimbath ED, **Op ‘t Eynde J**, Kait JR, Bass CR. (2023). “Modelling viscoelastic creep response of porcine lumbar spinal units exposed to repeated flexion-compression loading.” *International Research Council on Biomechanics of Injury*.

Ortiz-Paparoni MA, Morino CF, **Op ‘t Eynde J**, Kait JR, Bass CR. (2022). “Translating post-mortem human subject injury risk to dummy injury risk at iso-energy.” *International Research Council on Biomechanics of Injury*.

Eckersley CP, **Op ‘t Eynde J**, Abrams MZ, Yu AW, Li M, Yao J, Bass CR (2020). “Acoustic detection of blunt-induced cavitation in the head.” *International Research Council on Biomechanics of Injury.*

Conference Presentations

Op ‘t Eynde J, Shah AS, McMahon JA, Pang DY, Salzar RS, Bass CR, Yoganandan N, McEntire BJ. (2023, October 10-12) “Behind armor blunt trauma injury risks, risk curves, and injury criteria using cadaver and animal surrogates.” *SAFE Symposium*, Virginia Beach, VA.

Op ‘t Eynde J, Pang DY, Morino CF, Abrams MZ, Kait JR, Salzar RS, Bentley TB, Shender BS, Bass CR (2022, September 12-15). “The severe limitations of clay for assessing human response for behind armor blunt trauma.” *Military Health System Research Symposium*, Kissimmee, FL.

Op ‘t Eynde J, Yu AW, Eckersley CP, Bass CR (2021, July 8-9). “Primary blast wave protection in combat helmet design: a historical comparison between present day and WWI.” *Blast Injury Conference*, London, United Kingdom.

Op ‘t Eynde J, Eckersley CP, Salzar RS, Stemper BD, Shender BS, Bentley TB, Bass CR (2021, May 24-25). “Behind armor blunt trauma (BABT) indenter simulating high-velocity impacts from rifle rounds on hard body armor.” *Injury Biomechanics Symposium*, Columbus, OH (virtual).

Op ‘t Eynde J, Eckersley CP, Bass CR (2019, October 14-16). “Injury test model for behind armor blunt trauma.” *SAFE Symposium*, Reno, NV.

Op ‘t Eynde J, Eckersley CP, Bass CR (2019, May 19-21). “High-rate viscoelastic shear model of porcine skin, lung, and liver tissue.” *Injury Biomechanics Symposium*, Columbus, OH.

Op ‘t Eynde J, Shridharani JK, Ortiz-Paparoni MA, Kait JR, Voo LM, Bass CR (2018, July 8-12). “Characterization of acoustic emissions in cervical spinal compression injury.” *World Congress of Biomechanics*, Dublin, Ireland.

Op ‘t Eynde J, Yu AW, Eckersley CP, Bass CR (2018, May 20-22). “Blast wave protection in combat helmet design: a historical comparison.” *Injury Biomechanics Symposium*. Columbus, OH.

Pang DY, **Op ‘t Eynde J**, Salzar RS, Bass CR (2023, August 14-17). “Thoracic deformation under backface impact in hard body armor: clay vs human cadaver.” *Military Health System Research Symposium*. Kissimmee, FL.

Shah AS, Yoganandan N, Stemper BD, **Op ‘t Eynde J**, Bass CR, McMahon JA, Salzar RS, McEntire JB (2023, August 14-17). “Use of different types of biological human surrogates to develop regional tolerances for behind armor blunt trauma: preliminary liver test results.” *Military Health System Research Symposium*, Kissimmee, FL.

Berthelson PR, McMahon JA, Shah A, **Op ‘t Eynde J**, Salzar RS, McEntire JB (2023, August 14-17). “Comparison of preliminary behind armor blunt trauma-induced rib fracture risk for porcine cadavers and post-mortem human subjects.” *Military Health System Research Symposium*, Kissimmee, FL.

Morino CF, Schmidt AL, Dimbath E, Middleton ST, Kait JR, Shridharani JK, Ortiz-Paparoni MA, Klinger J, **Op ‘t Eynde J**, Bass CR. (2023, October 11-14). “Human and porcine lumbar endplate injury risk in repeated flexion-compression.” *Biomedical Engineering Society Annual Meeting*, Seattle, Washington.

Ortiz-Paparoni MA, Morino CF, **Op ‘t Eynde J**, Kait JR, Bass CR. (2022, September 14-16). “Translating Injury Metrics from Cadaver to Test Surrogate Using an Iso-energy Approach.” *International Research Council on Biomechanics of Injury*, Porto, Portugal.

Ortiz-Paparoni MA, Morino CF, **Op ‘t Eynde J**, Kait JR, Bass CR. (2022, July 10-14). “Translating Injury Metrics from Cadaver to Test Surrogate Using an Iso-energy Approach.” *World Congress of Biomechanics*, Taipei, Taiwan (virtual).

Morino CF, Ortiz-Paparoni MA, **Op ‘t Eynde J**, Kait JR, Abrams MA, Pintar FA, Yoganandan N, Moore J, Loftis KL, Barnes DR, Bass CR. (2022, May 23-24). “Expanded Combined Lumbar Injury Criterion Due to Underbody Blast.” *Injury Biomechanics Symposium*. Columbus, OH.

Schmidt AL, Morino CF, Shridharani JK, **Op ‘t Eynde J**, Kait JR, Ortiz-Paparoni MA, Shender BS, Bentley TB, Bass CR. (2022, September 12-16). “Long-term lumbar spine loading flexion/compression injury and response.” *Military Health System Research Symposium*. Kissimmee, FL.

Ortiz-Paparoni MA, Bigler BR, Cox CA, Schmidt A, Shridharani J, Kait J, **Op ‘t Eynde J**, Voo LM, Bass CR (2018, July 8-12). “Rate and posture effects on the cervical spine stiffness during high rate vertical loading.” *World Congress of Biomechanics*. Dublin, Ireland.

Yu AW, **Op ‘t Eynde J**, Bass CR (2017, July 7-12). “Investigation of CSF cavitation as an injury mechanism of traumatic brain injury.” *Annual Symposium of the National Neurotrauma Society*, Snowbird, UT.