ORNWIPA THAMSUWAN, Engineer-in-Training

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I have a strong quantitative background, formal education and experience in industrial engineering with focus on applied statistics and human factors. I am seeking a career transition to the fields of machine learning and artificial intelligence.

EDUCATION *(Assessed by World Education Services, Ref No. 3941268)*

Ph.D. Industrial Engineering, University of Washington 2012/09 - 2016/08

M.S. Industrial Engineering, University of Washington 2009/09 - 2011/06

B.Eng. Industrial Engineering, Chulalongkorn University 2004/06 - 2008/04

SELECTED PROFESSIONAL DEVELOPMENT

Artificial Intelligence, Columbia University 2020/02 - 2020/05

Introduction to Linux, Linux Foundation 2019/08 - 2020/01

Machine Learning, Stanford University 2018/10 - 2019/01

Global Integrated Systems Engineering, University of Washington 2009/09 - 2010/06

WORK EXPERIENCE

University of Saskatchewan, Saskatoon, Canada

Research Fellow, Canadian Centre for Health and Safety in Agriculture 2018/01 - 2020/06

- Started a project for on-farm exoskeleton trials: developed research protocols to measure workloads while farmers used an exoskeleton for farm tasks, applied and obtained grants
- Led conducting research: recruited participants, collected data, developed algorithms to analyze data using R, disseminated research findings in conferences and publications

Universidad de las Américas Puebla, San Andrés Cholula, México

Visiting Professor, Industrial and Mechanical Engineering 2017/08 - 2017/12

- Taught courses: Statistical Inference and Design of Experiments
- Designed and taught extracurricular 'Introduction to R programming language' workshops
- Co-developed and co-taught biomedical engineering laboratory sessions

Institute for Health Metrics and Evaluation, Seattle, USA

Research Fellow, Global Burden of Diseases 2016/11 - 2017/07

- Applied Bayesian statistics to co-developed algorithms for predicting risk of diseases
- Gave presentations on the statistical modeling of diseases to external review panels

University of Washington, Seattle, USA

Research Assistant, Industrial and Systems Engineering 2012/09 - 2016/09

- Led field studies on ergonomic risks in apple harvesting workers
- Developed computational algorithms to characterize ergonomic exposures

Research Scientist, Environmental and Occupational Health Science 2010/06 - 2012/08

- Collected and analyzed data of whole-body vibration on metro buses
- Collaborated with municipality transit organization in conducting research

Teaching Assistant, Probability and Statistics for Engineers 2015/01 - 2015/03

- Tutored undergraduate students, and graded homework and exams

Student Assistant, Study Abroad Program, Irbid, Jordan 2012/08 - 2012/09

- Updated the 'Water in Arid Land' seminar web page

Student Specialist, Libraries Southeast Asia Section 2009/10 - 2011/06

- Transliterated Thai materials, and provided consultations to catalogers and archivists

Toyota Motor Asia Pacific – Eng. & Mfg., Samutprakarn, Thailand

Engineer, Technical Planning and Engineering Administration 2008/04 - 2009/07

- Modified workflows to improve the process of the production and circulation of drawings
- Provided troubleshooting on CATIA v5 and Toyota in-house information-sharing system

Nidec Precision, Ayutthaya, Thailand

Intern, Quality Assurance 2007/08 - 2008/03

- Designed sampling plans to minimize cost of quality by applying statistical process control
- Collected data on cost of quality-related efforts (inspection, recalls, rework) from factory

Colgate Palmolive, Chonburi, Thailand

Intern, Logistics 2007/04 - 2007/05

- Conducted time-motion studies of forklift operation at the distribution center
- Conducted cost-benefit analysis of proposed layouts of the distribution center

PROFESSIONAL SERVICES

Washington State Department of Labor and Industries, Olympia, USA 2018/02 - 2019/05

Advisory Committee Member in 'Safety and Health of Exoskeleton at Workplace'

BURN Design Lab, Vashon Island, USA 2013/10 - 2017/05

Consultant providing iterative feedback charcoal stove handle design

SELECTED VOLUNTEER PROJECTS

Geospatial pattern of the equity of access to clean water in East Africa 2015/01 - 2015/03

- Applied geospatial autocorrelation and high/low clustering tools, i.e. Moran's I & Getis-Ord General G, to analyze the inequality of access to clean water across geographical regions

Characterizing land cover and predicting light intensity in Seattle 2014/09 - 2014/12

- Classified land cover using unsupervised classification on USGS satellite images
- Collected light intensity, used Normalized Difference Vegetation Index from satellite images, and percentages of tree canopy and developed imperviousness from National Land Cover Database, to build a linear regression model in R to predict land cover

Predicting the suitability of malaria vector in East Africa 2013/09 - 2013/12

- Processed GIS vector data of human-related activities, built environment and land use categories into raster dataset such as proximity from towns, roads and water bodies
- Used maximum entropy (an open-source software based on machine learning algorithms to model probability of suitable conditions for species) on raster data of climate, elevation, urbanity, percentage of forest, and population density to predict the probability of the presence of malaria vector and to calculate variable contribution to the malaria prevalence

Multi-objective network optimization for hazardous waste routing 2012/09 - 2012/12

- Replicated to validate network optimization models that reduced risk and cost associated with hazardous waste handling, constrained under the locations, types and capacities of treatment facilities, and the locations and waste amounts from communities

Simulation modeling of IT helpdesk in Siriraj Hospital, Bangkok, Thailand 2007/08 - 2007/10

- Analyzed probability distributions of call's inter-arrival time and operators' service time
- Built a discrete-event simulation model for workforce scheduling to reduce abandoned calls for service while maximizing the utilization of workers

SELECTED COMMUNITY SERVICES

Foundation for International Understanding Through Students, Seattle, USA 2010/01 - 2017/07

- Facilitated international individuals to participate in community gatherings
- Served as local ambassador for participants of the Study in the U.S. Institute program
- Performed music and directed an ensemble in intercultural and outreach events
- Shared Thai cultures to K-12 students in community outreach programs

High Atlas Foundation, Marrakesh, Morocco 2015/08 - 2015/09

- Assessed agricultural practice and water infrastructure in Amsouzert village
- Interviewed villagers on their needs, concerns, and ideas in social development
- Wrote parts of a grant proposal to build reservoirs and acquire saffron seeds

Engineers Without Borders, UW Chapter, Seattle, USA 2013/09 - 2014/06

- Reviewed user's experience aspects in biomass cook stoves in East Africa

International Training and Education Center for Health, Port-au-Prince, Haiti 2013/08 - 2013/09

- Created a mobile application for field data collection for the Monitoring & Evaluation Team to track use of the national electronic medical record and laboratory information system

El Fuego Del Sol, Port-au-Prince, Haiti 2013/08 - 2013/09

- Drafted drawings of briquette stamping machines

Haiti Communitere, Port-au-Prince, Haiti 2013/03 - 2013/08

- Designed and set up facilities that recycles polystyrene food containers into construction blocks, using time-motion studies, work sequencing, line balancing and ergonomics

Engineers Without Borders, UW Chapter, Seattle, USA 2011/09 - 2012/06

- Performed tests for water turbidity and energy consumption of water treatment units

STEM Outreach Camp, Kanchanaburi (2008/03) and Chaiyaphum (2007/03), Thailand

- Taught mathematics to rural underprivileged high-school students
- Mentored students on how to prepare for university entrance examinations

Academic Counseling for Engineering Study Camps, Bangkok, Thailand 2006/03 - 2006/10

- Coordinated with student volunteers and led weekly officers' meetings
- Designed and implemented the overnight camp schedule and security guards
- Coordinated with university staffs for access to classrooms and laboratories

AWARDS & RECOGNITIONS

University of Saskatchewan, 1st Place of the Postdoc 3-Minute Thesis Competition 2019/10

Saskatchewan Health Research Foundation, Top Research Fellowship 2018/12

International Journal of Industrial Ergonomics, one of five most cited papers 2016/12

Alpha Pi Mu Industrial Engineering Honor Society 2016/05

Student who applied engineering in promoting social justice within community and ethicality

GRANT HISTORY

Saskatchewan Health Research Foundation, Research Fellowship 2018/07 - 2020/06

Take a load off: An ergonomic evaluation of exoskeletons for Saskatchewan farmers

Alberta Ministry of Labour, Occupational Health and Safety Program 2019/01 - 2019/12

Combining health and productivity in agriculture: An ergonomic evaluation of exoskeletons for farm tasks

PUBLICATIONS

Thesis

1. **Thamsuwan O**. Objective methods for characterizing physical exposures which may contribute to work-related musculoskeletal disorders in agricultural workers, 2016 Thesis (Ph.D.), University of Washington.
2. **Thamsuwan O**. Whole body vibration exposures in bus drivers: a comparison between high-floor coach and low-floor city bus, 2011 Thesis (M.S.), University of Washington.

Journals

1. Omoniyi A, Trask C, Milosavljevic S, **Thamsuwan O.** (under review) Farmers' perceptions of exoskeleton use on farms: Finding the right tool for the work(er). International Journal of Industrial Ergonomics.
2. **Thamsuwan O**, Milosavljevic S, Srinivasan D, Trask C. (under review) Can exoskeleton reduce low back muscular activity during farm tasks? PLOS ONE.
3. **Thamsuwan O**, Galvin K, Tchong-French M, Aulck L, Bolye L, Ching RP, McQuade KJ, Johnson PW. (under review) Comparisons of physical exposure between workers harvesting apples on mobile orchard platforms and ladders Part 2: repetitive upper arm motions. Applied Ergonomics.
4. **Thamsuwan O**, Galvin K, Tchong-French M, Aulck L, Bolye L, Ching RP, McQuade KJ, Johnson PW. (under review) Comparisons of physical exposure between workers harvesting apples on mobile orchard platforms and ladders Part 1: back and upper arm postures. Applied Ergonomics.
5. **Thamsuwan O**, Galvin K, Tchong-French M, Kim JH, Johnson PW. (2019) A feasibility study comparing objective and subjective field-based physical exposure measurements during apple harvesting with ladders and mobile platforms. *Journal of Agromedicine*. 24(3):268-278.
6. GBD 2016 Causes of Death Collaborators. (2017). Global, regional, and national age-sex specific mortality for 264 causes of death, 1980–2016: a systematic analysis for the Global Burden of Disease Study 2016. The Lancet. 390(10100): 1151-1210.
7. GBD 2016 Disease and Injury Incidence and Prevalence Collaborators. (2017). Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. The Lancet. 390(10100): 1211-1259.
8. GBD 2016 DALYs and HALE Collaborators. (2017). Global, regional, and national disability-adjusted life-years (DALYs) for 332 diseases and injuries and healthy life

expectancy (HALE) for 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. The Lancet. 390(10100): 1260-1344.

9. GBD 2016 Risk Factors Collaborators. (2017). Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. The Lancet. 390(10100): 1345-1422.
10. Garza JL, Cavallari JM, Eijckelhof BHW, Huysmans MA, **Thamsuwan O**, Johnson PW, Dennerlein JT. (2015). Office workers with high effort-reward imbalance and over-commitment have greater decreases in heart rate variability over a two-hour working period. International Archives for Occupational and Environmental Health. 88: 565-575.
11. Kim JH, Aulck L, **Thamsuwan O**, Bartha M, Harper C, Johnson PW. (2014). The effects of touch screen virtual keyboard key sizes on productivity, usability, wrist posture and typing force. Human Factors. 56(7): 1235-1248.
12. **Thamsuwan O**, Blood RP, Ching RP, Boyle L, Johnson PW. (2013). Whole body vibration exposures in bus drivers: A comparison between a high-floor coach and a low-floor city bus. International Journal of Industrial Ergonomics. 43(1): 9-17.

Conference Proceedings

1. **Thamsuwan O**, Galvin K, Tchong-French M, Hughes M, Gregersen K, Palmandez P, Negrete M, Johnson PW. (2018). Field-based electromyography to assess shoulder muscle activity during repetitive tasks: an application in apple harvesting. ACE-CROSH 2018, page 108-109.
2. **Thamsuwan O**, Johnson PW. (2015). Comparing upper arm and back postural exposures between apple harvesting with ladders and mobile platform. Proceedings of the Human Factors and Ergonomics Society Annual Meeting. 59(1), 1252-1256.
3. **Thamsuwan O**, Aulck L, Galvin K, Johnson PW. (2015). Characterizing repetitive upper arm motions in apple harvesting. Profeedings 19th Triennial Congress of the IEA, page 1-5.
4. **Thamsuwan O**, Galvin K, Aulck L, Johnson PW. (2014). Repetitive shoulder motions in apple harvesting tasks using ladders and mobile platform. Proceedings of the Human Factors and Ergonomics Society Annual Meeting. 58(1), 1585-1589.
5. Kim JH, Aulck L, **Thamsuwan O**, Bartha M, Harper C, Johnson PW. (2013). The effects of virtual keyboard key sizes on typing productivity and physical exposures. Proceedings of the Human Factors and Ergonomics Society Annual Meeting. 57(1), 887-891.
6. Kim JH, Aulck L, **Thamsuwan O**, Bartha M, Harper C, Johnson PW. (2013). The effects of touch screen virtual keyboard key sizes on typing performance, typing

biomechanics and muscle activity. The International Conference on Digital Human Modeling and Applications in Health, Safety, Ergonomics, and Risk Management, page 239-244.

7. **Thamsuwan O**, Blood RP, Lewis C, Rynell PW, Johnson PW. (2012). Whole body vibration exposure and seat effective amplitude transmissibility of air suspension seat in different bus designs. Proceedings of the Human Factors and Ergonomics Society Annual Meeting. 56(1), 1218-1222.

PRESENTATIONS

Invited Presentations

1. **Thamsuwan O.** An ergnonmic evaluation of exoskeleton use in agriculture. Canadian Centre for Health and Safety in Agriculture seminar, Saskatoon, Canada, 2020/02.
2. **Thamsuwan O**. Help or Hindrance: Exoskeletons for Farmers – Research Progress, Canadian Society of Safety Engineering Luncheon, Saskatoon, Canada, 2019/12.
3. **Thamsuwan O**. Quinlan E, Rayan S. Interdisciplinary Studies Panel Presentation and Discussion on Interdisciplinary Research and Interdisciplinary Journeys, University of Saskatchewan, Saskatoon, Canada, 2019/11.
4. **Thamsuwan O**. Are exoskeletons suitable for farm use in Saskatchewan? Research Translation Day, School of Rehabilitation Science, University of Saskatchewan, Saskatoon, Canada, 2018/10.
5. **Thamsuwan O**. Objective methods for characterizing work postures and muscle activity: an application in apple harvesting. Exoskeleton Research and Development Group, Universidad de las Américas Puebla, San Andrés Cholula, México, 2017/10.
6. **Thamsuwan O**, Vos T. Migraine. An External Review for Global Burden of Disease Study 2016, United States, 2017/02.
7. **Thamsuwan O**, Vos T. Low Back Pain. An External Review for Global Burden of Disease Study 2016, United States, 2017/01.

*Conference Oral Presentations (*denotes the presenter)*

1. **Thamsuwan O***, Milosavljevic S, Trask C. A field study evaluating the use of a passive exoskeleton as potential intervention for mitigating low back pain risk factors in farmers. Canadian Agricultural Safety Association Annual Conference, Quebec City, Canada, 2019/10.
2. **Thamsuwan O**, Milosavljevic S, Trask C*. A pilot study evaluating the use of a passive exoskeleton as potential intervention for mitigating low back pain risk factors in farmers. Prevention of Work-Related Musculoskeletal Disorders, Bologna, Italy, 2019/09.

3. **Thamsuwan O***, Galvin K, Tchong-French M, Hughes M, Johnson PW. Different EMG normalization methods and implications for field-based data acquisition of muscle activity. Prevention of Work-Related Musculoskeletal Disorders, Toronto, Canada, 2016/06.
4. **Thamsuwan O***, Aulck L, Galvin K, Johnson PW. Characterizing repetitive upper arm motions in apple harvesting. Northwest Biomechanics Symposium, Seattle, United States, 2015/05.
5. **Thamsuwan O***, Galvin K, Aulck L, Johnson PW. A method for characterizing repetitive upper arm motions in apple harvesting and a comparison between working with ladders and mobile platforms. Safety and Health in Agricultural and Rural Populations, Saskatoon, Canada, 2014/10.
6. Galvin K*, **Thamsuwan O**, Johnson PW. Ergonomic comparison of apple picking from ladders, harvest-assist mobile platforms, and the ground. Safety and Health in Agricultural and Rural Populations, Saskatoon, Canada, 2014/10.
7. Johnson PW*, Ibbotson J, **Thamsuwan O**. Evaluating different seat and seat cushion designs on whole body vibration and seat effective amplitude transmissibility on buses. Prevention of Work-related Musculoskeletal Disorders, Pusan, Korea, 2013/07.
8. Johnson PW*, Ibbotson J, **Thamsuwan O**. Evaluation of seating alternatives to reduce WBV in buses. Whole Body Vibration Injuries, Amsterdam, Netherlands, 2013/06.
9. **Thamsuwan O***, Blood RP, Lewis C, Rynell PW, Johnson PW. Whole body vibration and seat effective amplitude transmissibility in different buses. American Conference on Human Vibration, Hartford, United States, 2012/06.

*Conference Poster Presentations (*denotes the presenter)*

1. Omoniyi A*, **Thamsuwan O**, Milosavljevic S, Trask C. Farmers' perceptions of exoskeleton devices and their potential to prevent back injuries in Saskatchewan farms. Annual Symposium of Saskatchewan Epidemiology Association, Regina, Canada, 2019/10.
2. **Thamsuwan O***, Johnson PW. Direct measurement of exposures to ergonomic risk factors in apple harvesting workers. Applied Ergonomics Conference, New Orleans, United States, 2019/03.
3. **Thamsuwan O***, Milosavljevic S, Trask C. Heuristic review of farm tasks compatibility to exoskeletons. Annual Symposium of Saskatchewan Epidemiology Association, Saskatoon, Canada, 2018/10.
4. Missiuna S*, Bashiri B, **Thamsuwan O**, Trask C. Does whole body vibration effect farm machinery egress? Annual Symposium of Saskatchewan Epidemiology Association, Saskatoon, Canada, 2018/10.

5. Omoniyi A*, Bashiri B, **Thamsuwan O**, Trask C. Finding traction for prevention efforts: Do farm machinery operators follow the recommendation for safe tractor egress? Annual Symposium of Saskatchewan Epidemiology Association, Saskatoon, Canada, 2018/10.
6. **Thamsuwan O***, Galvin K, Tchong-French M, Hughes M, Johnson PW. Ergonomic exposures in apple harvesting in Washington State. Migrant Labor and Global Health Conference, Davis, United States, 2017/03.
7. **Thamsuwan O***, Galvin K, Tchong-French M, Hughes M, Johnson PW. Ergonomic exposures in apple harvesting with ladders and mobile platforms in Washington State. Western Forum for Migrant and Community Health, Portland, United States, 2016/02.
8. **Thamsuwan O***, Galvin K, Tchong-French M, Palmandez P, Negrete M, Johnson PW. Ergonomic evaluation of harvest-assisted mobile orchard platform and ladder. Annual Meeting & Horticultural Expo of Washington State Tree Fruit Association, Yakima, United States, 2015/12.
9. Galvin K, **Thamsuwan O***, Zigman M, Johnson PW. Ergonomic comparison of pickers using ladders and a harvest assist mobile platform. Western Forum for Migrant and Community Health, Seattle, United States, 2014/02.
10. **Thamsuwan O***, Blood RP, Lewis C, Rynell PW, Johnson PW. Whole body vibration exposures in bus drivers: A comparison between high-floor coach and low-floor city buses. Northwest Biomechanics Symposium, Vancouver, Canada, 2011/06.

PEER REVIEWS

- Journal of Agricultural Safety & Health
- Journal of Occupational Rehabilitation
- Journal of Agromedicine
- Revista Ingeniería y Universidad: Engineering for Development
- Applied Ergonomics
- BMC Musculoskeletal Disorders