

Benjamin W.K. Hung

Curriculum Vitae

bwhung@colostate.edu

(617) 902-0231

Current Positions

- Operations Research Systems Analyst, U.S. Army Intelligence and Security Command (INSCOM), Fort Meade, MD 2017 – present
- Post-Doctoral Associate, Colorado State University, Fort Collins, CO 2018 – present

Education

- Ph.D. in Systems Engineering, Walter J. Scott, Jr. College of Engineering, Colorado State University (2017). GPA: 3.94/4.00
- M.S. in Operations Research, Massachusetts Institute of Technology (2010). GPA: 4.60/5.00
- Graduate Student Teaching Certificate, Teaching and Learning Laboratory, Massachusetts Institute of Technology (2010)
- B.S. in Mathematics, United States Military Academy (2001). GPA 3.95/4.33

Relevant Professional Experience

- Operations Research Systems Analyst, Active Duty Army Officer, FA49, Present Rank: Lieutenant Colonel 2008-present
- Chief of Assessments, 82nd Airborne Division, Fort Bragg, NC 2013 – 2015
- Assistant Professor and Department Academic Counselor, Department of Mathematics at West Point 2012 – 2013
 - Linear Algebra (Spring 2013)
 - Applied Statistics Course Director (Fall 2012)
- Instructor, Department of Mathematics at West Point 2010 –2012
 - Mathematical Modeling and Introduction to Calculus (Fall 2010, 2011)
 - Differential Calculus (Spring 2011, 2012)
- Student, Advanced Civil Schooling and Draper Laboratory Fellow, Massachusetts Institute of Technology 2008 –2010
- Commander, HHC, 3rd Brigade Special Troops Battalion, 3rd Brigade Combat Team, 10th Mountain Division (Light Infantry), NY 2005 –2007
- Provost Marshal, 3rd Brigade Combat Team, 10th Mountain Division (Light Infantry), NY 2004 –2005
- Platoon Leader and Executive Officer, 10th Military Police Company, 2003 –2004

10th Military Police Battalion (Provisional), NY

- Platoon Leader, 188th Military Police Company, 8th Military Police Brigade, Korea 2001 –2002

Research Areas of Interest

Data science, pattern detection and anomaly detection in social systems, network optimization, social network analysis, agent-based modeling, computational social systems, information extraction from text documents.

Graduate Courses

- **Ph.D.:** ENGR501 Foundations of Systems Engineering, ENGR531 Engineering Risk Analysis, CIS670 Advanced IT Project Management, MECH513 Simulation Modeling and Experimentation, ECE532 Dynamics of Complex Engineering Systems, ENGR530 Overview of Systems Engineering Processes
- **M.S.:** 6.431 Applied Probability, 15.093 Optimization Methods, 15.077 Statistical Learning and Data Mining, 15.094 System Optimization: Modeling and Computation, 6.207 Networks, 6.281 Logistical and Transportation Planning, 15.879 Research Seminar in System Dynamics.

Research Publications and Presentations

-Journal Publications:

B. Hung, A. Jayasuman and V. Bandara, "Finding Emergent Patterns of Behaviors in Dynamic Heterogeneous Social Networks," *IEEE Transactions on Computational Social Systems*, vol. 6, no. 5, pp. 1007-1019, 2019.

J. Klausen, R. Libretti, B. W. Hung and A. P. Jayasumana, "Radicalization Trajectories: An Evidence-Based Computational Approach to Dynamic Risk Assessment of 'Homegrown' Jihadists," *Studies in Conflict & Terrorism*, 2018

B. Hung, A. Jayasumana and V. Bandara, "INSiGHT: A system to detect violent extremist radicalization trajectories in dynamic graphs," *Data & Knowledge Engineering*, vol. 118, pp. 52-70, 2018.

B. Hung, S. Kolitz, and A. Ozdaglar, "Optimization-Based Influencing of Village Social Networks in a Counterinsurgency," *Association of Computing Machinery Transactions on Intelligent Systems and Technology (ACM- TIST)*, Volume 4, Issue 3, June 2013.

-Conference Presentations:

B. Hung, S. Muramudalige, A. Jayasumana, J. Klausen, R. Libretti, E. Maloney and P. Renugopalakrishnan, "Recognizing Radicalization Indicators in Text Documents Using Human-

in-the-Loop Information Extraction and Natural Language Processing Techniques," in *Proceedings of the IEEE International Symposium on Technologies for Homeland Security*, Woburn, MA, 2019.

S. R. Muramudalige, B. W. K. Hung and A. P. Jayasumana, "Investigative Graph Search using Graph Databases," in *Proceedings of Graph Computing (GC2019)*, Laguna Hills, CA, 2019.

B. Hung, A. Jayasumana, and Vidarshana Bandara, "INSiGHT: A System for Detecting Radicalization Trajectories in Large Heterogeneous Graphs," *Proceedings of the IEEE International Symposium on Technologies for Homeland Security (HST)*, 2017.

B. Hung, A. Jayasumana, and Vidarshana Bandara, "Pattern Matching Trajectories for Investigative Graph Searches," *Proceedings of the 3rd IEEE International Conference on Data Science and Advanced Analytics (DSAA)*, 2016.

B. Hung, A. Jayasumana, and Vidarshana Bandara, "Detecting Radicalization Trajectories Using Graph Pattern Matching Algorithms," *Proceedings of the IEEE International Conference on Intelligence and Security Informatics (ISI)*, 2016.

B. Hung, and A. Jayasumana, "Investigative Simulation: Towards Utilizing Graph Pattern Matching for Investigative Search," *Proceedings of the International Symposium on Foundations of Open Source Intelligence and Security Informatics (FOSINT-SI) and IEEE/ACM International Conference in Advances in Social Network Analysis and Mining (ASONAM)*, 2016.

W. Duff, R. Dowling, B. Hung, G. Lancaster, and L. Ridge, "Simulation of Auto Design Performance in the Market to Meet Fuel Efficiency Standards," *Proceedings of the Winter Simulation Conference*, poster presentation, Huntington Beach, 2015.

D. Beskow, B. Hung, R. Croft, Z. Horovitz, T. Maeker, M. Malta, and T. Schafer, "Decision Support Tool for the Global Reaction Force Outload Process," *Proceedings of the Industrial and Systems Engineering Research Conference (ISERC)*, Montreal, Canada, June 2014.

E. Thornburg, B. Hung, and J. Jackson, "Learning with the iPad: Does this technology help or hinder student understanding," *Joint Mathematics Meetings*, Mathematical Association of America, Boston, January, 2012.

B. Hung, S. Kowitz, and A. Ozdaglar, "Optimization-Based Influencing of Village Social Networks in a Counterinsurgency," *Proceedings of the 4th International Conference on Social Computing, Behavioral-Cultural Modeling, and Prediction (SBP)*, LNCS 6589, pp. 10-17, March 2011.

-Other Presentations and Posters:

B. Hung, A. Jayasumana, "INSiGHT: Investigative Search for Graph Trajectories," Colorado State University Graduate Student Showcase, poster presentation, 2016. **"CSU Ventures Innovation Award- Silver"**

B. Hung, A. Jayasumana, and Vidarshana Bandara, "Detecting Radicalization Trajectories Using Graph Pattern Matching Algorithms" IEEE International Conference on Intelligence and Security Informatics (ISI), poster presentation, 2016. **"Best Poster Award Winner"**

B. Hung, "Influencing Activities in a Counterinsurgency in Afghanistan," Workshop on Populations and Crowds, Viterbi School of Engineering, University of Southern California, September 2012.

B. Hung and S. Kolitz, "Social network generation model for rural Afghanistan," *Human Social Cultural Behavioral (HSCB) Modeling Program Focus 2011 Conference*, poster presentation, February 2011.

B. Hung, "Optimization-Based Influencing of Village Social Networks in a Counterinsurgency," Minerva at West Point Workshop, May 2012.

B. Hung, "Optimization-Based Influencing of Village Social Networks in a Counterinsurgency," Counterinsurgency and Counterterrorism Workshop, Security and Studies Program, Massachusetts Institute of Technology, 2011.

-Thesis:

B. Hung, "A Graph-Based, Systems Approach for Detecting Violent Extremist Radicalization Trajectories and Other Latent Behaviors," Doctoral Dissertation, Walter Scott, Jr. College of Engineering, Colorado State University, Advisor: Anura P. Jayasumana, July 2017.

B. Hung, "Optimization-Based Selection of Influential Agents in a Rural Afghan Social Network," Master's Thesis, MIT Operations Research Center, Thesis Supervisor: Asuman Ozdaglar, June 2010.

Technical Skills

- Programming: Python, MATLAB, R, Visual Basic for Applications (VBA), Pajek, AMPL
- Data Storage and Visualization: Elasticsearch, Kibana, Neo4j Graph Database

Service and Awards

-Service:

- Member of the Technical Program Committee for the FOSINT-SI 2017 (International Symposium on Foundations of Open Source Intelligence and Security Informatics), 2017.
- Ad-Hoc Reviewer for IEEE International Symposium on Technologies for Homeland Security (HST 2017) and Association of Computing Machinery Transactions on Intelligent Systems and Technology Journal (ACM- TIST).
- Computer Laboratory Volunteer, Developmental Disabilities Resource Center (DDRC), Lakewood, Colorado, 2016- 2017.

- Department Academic Counselor, Department of Mathematical Sciences, West Point 2011-2013
- Co-coordinator, Mathematical Competition in Modeling (MCM) and Interdisciplinary Competition in Modeling (ICM), West Point, 2011 and 2012
- Co-treasurer of the US Army Garrison (USAG) Military Police Company Family Readiness Group, 2011 -2012
- Officer-in-Charge of West Point Officer's Christian Fellowship, 2011-2013
- Small Group Leader, West Point Officer's Christian Fellowship, 2010-2013
- Volunteer Tutor, Graduate Support Program, Nora Cronin Presentation Academy, Newburgh, NY, 2011-2013

-Honors and Achievements:

- Liniger Honor, Service, and Commitment Veterans Scholarship, Colorado State University, 2014-2017
- Charles Stark Draper Laboratory Fellowship, Cambridge, MA, 2008-2010
- General Omar Bradley Officer Research Fellowship in Mathematics, 2009, 2016
- Distinguished Honor Graduate, Military Police Captains Career Course, United States Army Military Police School, 2008
- Distinguished Honor Graduate, Military Police Officer Basic Course, United States Army Military Police School, 2001
- Honor Graduate, United States Military Academy, 2001
- General Omar Bradley Award for Excellence in Elective Mathematics, West Point, 2001 (awarded for the highest QPA in elective math courses)
- Colonel Herbert Bainbridge Hayden Memorial Award, West Point, 2001 (awarded for highest QPA in basic sciences)

-Professional Affiliations

- Pi Mu Epsilon
- Military Operations Research Society
- IEEE