DAEYEOL CHANG

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EDUCATION

PhD University of Missouri-Columbia, Civil Engineering — May 2021
Dissertation: "Modeling transportation impacts of natural disasters"
Committee: Praveen Edara (Advisor, Interim Dean and Chair), Carlos Sun, Tim Matisziw and Yaw Adu-Gyamfi

MS Chung-Ang University, Urban Engineering (Focused on Transportation) — Feb 2014
Thesis: "A study on the driving commuters' dependence on expressways in Seoul Metropolitan Area"
Advisor: Tae wan Kim

BS Chung-Ang University, Urban Engineering — Aug 2011

HONORS AND AWARDS

Student honors
Listed on graduation honors — May 2021

Missouri Highway Safety and Blueprint Conference — Feb 2020
2nd prize on student poster session

ITS Heartland Conference — Apr 2019
2nd prize on student poster session

Missouri Highway Safety and Blueprint Conference — Feb 2019
3rd prize on student poster session

ITS Heartland Conference — Apr 2018
2nd prize on student poster session

High Honors — Spring 2011

High Honors — Fall 2010

RESEARCH EXPERIENCE

Position: Postdoctoral Fellow July 2021- Current

University of Missouri-Columbia, Columbia, Missouri, United States.

Project name: Practices for Operational Traffic Simulation Models, Transportation Research Board Research Council, United States.

- Review and document DOT practices for operational traffic simulation models including macro, micro and mesoscopic resolutions.
- Investigate the traffic simulation across the nationwide including survey responses.

Project name: Identification of a Response and Rescue Network for the St. Louis Region, Missouri Department of Transportation, United States.

- Creation of evacuation demand of the St. Louis region under the extreme earthquakes with survey design, data collection, and utilizing demand model.
- Design various evacuation scenarios including damaged road networks and trip matrix adjustments.
- Perform dynamic traffic assignment (DTA) with CUBE Avenue software to provide the results such as delays, volumes, and bottlenecks to determine egress/ingress routes and bottlenecks.

Project name: Collaborative Research: Deep Learning Models and Tools for Disaster Evacuation and Routing, Missouri Department of Transportation, United States.

- Evacuation modeling of the New Madrid region focused on routing strategies with survey and census data
  - Survey design and analysis based on statistical/machine learning and empirical approach
  - Generate evacuation demand by using trip generation, distribution, and assignment with transportation planning software (VISUM) and export to the Vissim.

- Developing evacuation traffic simulation with VISSIM software
  - Road network creation by open-source data with API
  - Scenario development with various demand and traffic controls for dynamic traffic assignment (DTA).
  - Analyze performance measurement (i.e., travel time and bottlenecks and OD pair results)

Position: Graduate Research Assistant Aug 2016- May 2021

University of Missouri-Columbia, Columbia, Missouri, United States.

Project name: Collaborative Research: Hurricane Evacuation Performance Measurement, National Science Foundation, United States.

- Developed hurricane evacuation model

- Creating scenarios based on the various combinations of demand and network sets.
- Network coding to implement mesoscopic traffic simulation (DTA) using DynusT software.
- Generated evacuation demand based on the travel demand model.
- Extract simulation outputs including clearance time, vehicle evacuation, delay, etc. - from vehicle trajectory files using Python and Matlab.

Project name: Immersive Work Zone Inspection Training Using Virtual Reality, Missouri Department of Transportation, United States.

- Collaborative project with Department of Architecture Studies
- Focused on developing immersive training module
  - Designing a VR module based on Unity 3D game engine.
  - Vehicles and facilities coded by C# language
  - Experiment for focus group
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Position: Researcher Apr 2015- July 2016

Korea Transport Institute, Sejong, Korea

Project name: Vision Zero- Traffic Safety Project

- To analyze and predict traffic accidents based on historical data base.
- Efforts to prevent traffic accidents and enact legislation.

Project name: Village Zone- Traffic Safety Project

- Analysis of traffic accidents focused on crash hotspot in selected cities.
- Evaluate the effectiveness of installment of Village Zone

Position: Graduate Research Assistant March 2012- February 2015

Chung-Ang University

Project name: A Study on the Reorganization of Public Transportation Route System Reflecting Traffic Demand and Congestion, Seoul Metropolitan Council (June 2013 – November 2013)

- Analyzed and compared transit demand and supply based on Smart Card Data and Korea Transport Database
- Identify concentrated points of ridership and compare them to the supply to evaluate the demand-supply level.
- Calculate the appropriate number of vehicles operated by route.

Project name: A preliminary feasibility study on the mitigation project of Jangsu-Gyeyang Expressway, Korea Development Institute (June 2013 – December 2013)

- Forecasting traffic for establishing new routes to reduce the congestion on expressways.

- Feasibility study analysis based on Korea Transport Database – utilized TransCAD and Emme3 to forecast and calibrate.

WORK EXPERIENCE

Peer-Reviewer

- Journal of Advanced Transportation (2021.08 ~ Current)
- Transportation Research Interdisciplinary Perspectives (2020.11 ~ Current)
- Transportation Research Board (2017.09 ~ Current)

PUBLICATIONS

Journal Publications

(Peer-Reviewed)

Daeyeol Chang., Praveen Edara., Murray-Tuite, P., Trainor, J., Triantis, K., "Taking the Freeway: Inferring Evacuee Route Selection from Survey data". *Transportation Research Interdisciplinary Perspectives* Volume 11, September 2021.

Aati, Khaled, Daeyeol Chang, Praveen Edara, and Carlos Sun. "Immersive Work Zone Inspection Training Using Virtual Reality." *Transportation Research Record* 2674, no. 12 (December 1, 2020): 224–32.

Daeyeol Chang, and Keemin Sohn. "Commuter Dependence on Expressways When Travelling to Work." *Proceedings of the Institution of Civil Engineers - Transport* 168, no. 1 (February 1, 2015): 23–33.

Conference Papers

(Peer-Reviewed)
Chang, D., "The Rise of Private Vehicles: Investigating Factors for Mode shift after COVID-19.", *Transportation Research Board 103rd Annual Meeting*, 2024.

Chang, D., J. Hopfenblatt, P. Edara, and B. Balakrishnan. "Immersive Virtual Reality Training for Inspecting Flagger Work Zones." *IEEE International Conference on Artificial Intelligence and Virtual Reality (AIVR)*, 327–30, 2020.

Chang, D., Edara, P., Murray-Tuite, P., Trainor, J., Triantis, K., "Taking the Freeway: Inferring Evacuee Route Selection from Survey data". *Transportation Research Board 99th Annual Meeting*, 2020.

PRESENTATIONS

Chang, D. and Edara, P., "Modeling Transportation Impacts of a New Madrid Seismic Zone Earthquake.", *Transportation Resilience 2023: International Conference on Extreme Weather and Climate Change Challenges*.

Chang, D., Seul, J., Lim, J., and Umm, K. "The effectiveness of pilot study of Village zone in Korea." *Conference of Korean Society of Transportation, Jeju, Korea, 2016.*

Chang, D., Sohn., K. "Commuters' dependence on expressways in Seoul Metropolitan Area." *Conference of Korean Society of Transportation,* Dae-gu, Korea, 2012.

SOCIAL EXPERIENCE

Member, University of Missouri-Columbia Student Organization Group (2016 to 2021).

Treasure, University of Missouri-Columbia Student Organization Group (2019 to 2020).

Member, Korean American Scientists and Engineers Association (Since 2017).

COMMUNITY SERVICE

Worship leader, Korean First Presbyterian Church of Columbia, Missouri, 2017-2020.

Volunteer teacher, Community Child Center, Daejeon, Korea, 2008-2009.

President, University Students Christian Missionary Club, Chung-Ang University, Korea, 2005-2006.

LANGUAGES

English: Full professional proficiency

Korean: Native or bilingual proficiency

COMPUTER SKILLS

Programming: Python, R, Matlab, C#, MySQL

Applications: Vissim, DynusT, CUBE, Visum, TransCAD, ArcGIS, Unity 3D Engine, MS Office