



*Center for Health Outcomes and Informatics Research
Department of Health Informatics and Data Science*

HEALTH INFORMATICS SEMINAR SERIES

Presents:

“Delta Coverage: The Analytics Journey to Implement a Novel Nurse Deployment Solution”

Abstract: *In January 2021, Drs. Shi and Helm partnered with Indiana University (IU) Health System to develop a new internal travel nursing program. This program was designed to leverage a flexible pool of resource nurses that can be moved between IU's 16 hospitals. In contrast to traditional travel nursing programs, this program focuses on responding to short-term geographic fluctuations in patient census. To support this program, Drs. Shi and Helm developed a patient census forecast based on a deep generative model. This model avoids error accumulation in traditional time-series models and conditionally decouples the census distribution for each location and each day. This makes it efficient and low computational effort to use. Based on the census forecast, Drs. Shi and Helm formulated a two-stage stochastic program where the decision variables mimic the timing and type of decisions being made in practice. The integrated decision support tool (DSS) was implemented in October 2021 as a Microsoft Power BI application. The tool was run each day in real time from October 2021 to March of 2022. Analysis of the recommendations indicates system-wide improvements using the DSS: reductions of 5% understaffing, 3% misallocation of resource nurses, and 1% overstaffing. The annualized savings estimated at over \$400K with over 220 understaffed shifts being avoided.*

Panelists: Pengyi Shi, PhD and Jonathan Eugene Helm, PhD

When: April 26, 2023 12:00 pm – 1:00 pm (CST)

Join via Zoom Link: <https://luc.zoom.us/j/81969261104>

Pengyi Shi, PhD is an Associate Professor at the Krannert School of Management, Purdue University. She received her PhD degree in Industrial Engineering from Georgia Institute of Technology before joining Purdue in 2014. Her research interests include data-driven modeling and decision-making in healthcare and service operations. She has collaborated with practitioners and faculty members from different healthcare organizations, including major hospitals in the US, Singapore, and China. Her research has won the first place of MSOM Responsible Research in OM Award in 2021, the first place of INFORMS Pierskalla Best Paper Award in 2018, and the second place of POMS CHOM Best Paper Award in 2019 and 2020.

Jonathan Helm, PhD is an Associate Professor, Grainger Fellow, and Co-Director of the Center for the Business of Life Sciences at Indiana University's Kelley School of Business. He received his PhD in Industrial and Operations Engineering from the University of Michigan before joining Indiana University in 2012. He has been a part of analytics implementations in hospitals in the Midwest and East Coast of the United States and internationally. His research has won awards including MSOM Responsible Research, the Pierskalla Best Paper, and POMS CHOM Best Paper.

Accreditation Statement: The Loyola University Chicago Stritch School of Medicine is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians. The Loyola University Chicago Stritch School of Medicine designates this other activity for a maximum of 1.0 AMA PRA Category 1 Credit(s)[™]. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

* Visit [here](#) to watch previous presentations and to find more information about future Seminars.

