Department of Systems Engineering and Engineering Management

Seminar Series

Seminar I: **Modeling of Dynamic Biological and Social Systems**

Dr. David Ben-Arieh

Professor of Industrial Engineering

Kansas State University, USA

Seminar II: **Evaluation of Light Sources Used for Overhead Guide Sign Illumination**

Dr. Malgorzata J. Rys

Associate Professor

Kansas State University, USA

Date	31 July 2015 (Friday)
Time	2:45am (Tea/Coffee Service at 2:30am)
Venue	P6921, 6/F, AC1

Abstract (Seminar I)

Mathematical modeling of dynamic systems is a mature field of science that is well researched in terms of theory and applications. The presentation will focus on two contemporary health related problems that can be analyzed and improved upon using such mathematical modeling.

The presentation will focus on two dynamic systems – one modeling predator-prey relations that affect our food supply and the other modeling spread of a disease (human or animal related) and using preventive behavioral strategies. The first problem models the spread of the twospotted spider mite which is one of the most serious pests that cause damage to crops. Here we model the effect of using a predator mite to control the twospotted mite. In the second problem we model the dynamics of an epidemic including human behavioral changes using a spatial game.

Kansas State University hosting the Biosecurity Research Institute, and the Federal National Bio and Agro Defense facility focus on modeling biological systems mostly related to animal and plant health. This research supports K-State mission by improving food supply as well as societal health.

About the Speaker (Seminar I)

Dr. David Ben-Arieh is a Professor of Industrial Engineering at Kansas State University. Prior to joining Kansas State University, Dr. Ben-Arieh taught at the Department of Industrial Engineering and Management, Ben-Gurion University in Beer Sheva, Israel.

His industrial experience includes working for AT&T Bell Laboratories, and consulting for the aerospace industry and NASA.

Dr. Ben-Arieh holds a PhD in Industrial Engineering from Purdue University.

He concentrates mainly on applications systems design and modeling and holds one patent in this area. In recent years Dr. Ben-Arieh has focused on applications in Health Care Systems Management, including patients flow, information systems integration, and patient quality and safety improvements.

Currently David Ben-Arieh is the director of the Health Care Operations Resource Center at Kansas State University.

Abstract (Seminar II)

Departments of Transportation consider drivers' safety an important issue. Improving overhead guide signs visibility for drivers is essential step in increasing safety on highways and thus reducing crashes. Methods of improving overhead guide sign visibility include illumination by adding an external light source, and using retro-reflective sheeting material. Sign illumination is the focus of this presentation by comparing four light sources. The light sources were divided between two conventional sources: Metal Halide (MH), and High Pressure Sodium (HPS), and two sources of the new generation: Induction lighting, and Light Emitting Diode (LED). An experiment was conducted to compare the light distribution of each light source. In addition, a cost analysis was performed to compare the cost of light sources. Results of light distribution experiment and cost analysis revealed that

Induction lighting was the optimal light source that increases sign visibility, and consequently driver's safety on roadways during nighttime.

About the Speaker (Seminar II)

Malgorzata (Margaret) J. Rys is an Associate Professor in the Department of Industrial and Manufacturing Systems Engineering at Kansas State University. She obtained her integrated B.S/M.S degree from the Technical University of Wroclaw, Poland, and M.S. and Ph.D. from Kansas State University, all in Industrial Engineering. She has over 25 years of experience conducting research and teaching courses in human factors engineering, statistics, safety, engineering economy and quality. A number of her curses are electives for the Master of Engineering Administration and are taught trough distance education to the working professionals. During the past 25 years she has been principal or co-principal investigator on more than 50 projects covering a wide range of human factors applied to highway safety, hospital emergencies, and risk analysis.

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All are Welcome!

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