SUTD LIBRARY

ESD ENGINEERING SYSTEMS & DESIGN

Discovery

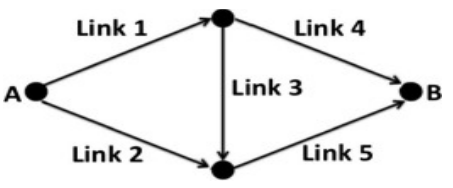
We SHARE to inspire and ignite ideas for
Engineering Systems & Design (ESD) Pillar!

The titles featured here are to give you a peek into the wealth of resources we have. We hope, through this will encourage you to explore and read further. Share with us topics of importance to ESD and we can introduce relevant titles from some 400,000 eBooks we carry.

February 2016

PUBLICATIONS BY ESD FACULTY

Beyond Normality: A Cross Moment-Stochastic User Equilibrium Model



By Tom Magnanti(SUTD President), Karthik Natarajan(ESD Associate Professor) and Selin Ahipasaoglu (ESD Assistant Professor)

Researchers have been long studying on ways to predicting road traffic flow and how to minimize transport costs. By developing the CMM-SUE (Cross Moment-Stochastic User Equilibrium) method, they aim to optimize traffic flow and minimize transport costs, is unique and workable. CMM-SUE offers modeling flexibility and computational advantages over other methods to model correlation effects from overlapping paths and avoids using simulation methods in computation.

Source: Transportation Research Part B: Methodological (November 2015)

High-Performance Integrated Control Of Water Quality And Quantity In Urban Water Reservoirs

By Stefano Galleli, ESD Assistant Professor

With more people living in cities, there is an increasing demand for drinking water. Assistant Professor Galleli and his team present a novel High-Performance Integrated Control (HPIC) framework, which is used to design the real-time operation of Marina Reservoir. The control framework has proven to reduce minimum salinity levels by nearly 40% and annual deficit of drinking water supply by about 2 times the active storage of the reservoir.

Source: Water Resources Research (November 2015)

LIFE CYCLE ASSESSMENT

Environmental Life Cycle Assessment of Nanosilver-Enabled Bandages

The use of silver nanoparticles (AgNPs) in the production process affects the life cycle assessment (LCA) of medical products, because these nanoparticles get released into the environment. An LCA from nanoparticle synthesis to end-of-life incineration was carried out for a commercially available nanosilver-enabled medical bandage. It was concluded that AgNPs are the largest contributor to environmental pollution of bandage making.

Source: Environmental Science & Technology (January 2015)

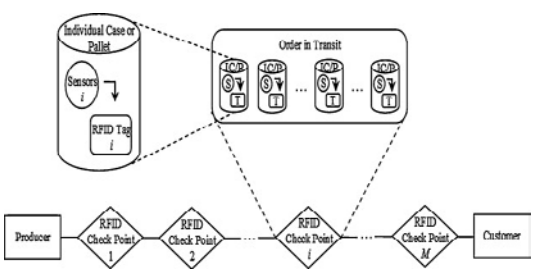
Comparative Life Cycle Assessment of Battery Storage Systems for Stationary Applications

Read about a comparative life cycle assessment (LCA) of four stationary battery technologies. The technologies are lithium-ion, lead-acid, sodium–sulphur, and vanadium-redox-flow. It was found that battery usage strongly influences the life cycle impacts. The authors of this article also strongly encourage the use of more efficient batteries, such as lithium-ion, for stationary grid operation.

Source: Environmental Science & Technology (April 2015)

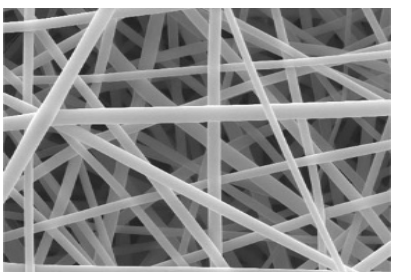
OPTIMIZATION

RFID-Wireless Sensor Networks Integration: Decision Models And Optimization Of Logistics Systems Operations



Food items are mostly perishable in nature. So, their transport makes the logistics process more complicated. The authors discuss crucial logistics operations aspects through the use of an integrated RFID-sensor network system. This system can detect the condition

Synthesis and Process Optimization of Electrospun PEEK-Sulfonated Nanofibers by Response Surface Methodology



In this study electrospun nanofibers were made. Response surface methodology was used for the modelling and optimization of the electrospinning process. The final optimization model was confirmed by statistical tests and validated by a comparison procedure of samples at different

of perishable products as they are moved downstream the supply chain before any product loss occurs.

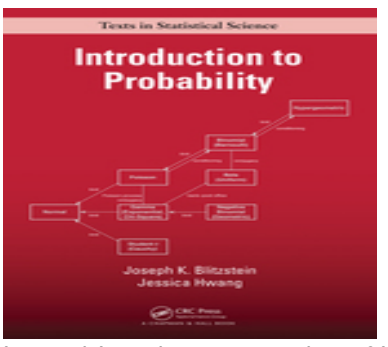
Source: Journal of Manufacturing Systems (April 2015)

sulfonation degrees, realized according to optimized conditions, for the production of homogeneous thin nanofibers.

Source: Materials (July 2015)

PROBABILITY APPLICATION

Introduction to probability



This book provides clear examples of how to apply probability concepts in real-life settings. We highlight that, for conditional probability, an example provided is a game where one could open different doors and get different prizes. In joint distributions, an example provided is of the failure probability rate of a fridge and a stove. There are many more conceptual examples in this book that are very interesting.

Source: CRC Press (2015)

A probability model for fully developed annular flow in vertical pipes: Prediction of the droplet entrainment

Vertical pipes are commonly used in buildings to transport water and air. The authors of this article developed a probability model for annular flow in vertical pipes. It is intended to predict the phase distributions and mechanical characteristics of the fluid flow. This model was shown to be strong in both in degree of accuracy and in convenience of use.

Source: International Journal of Heat and Mass Transfer (May 2015)