



Department of Statistics  
COLLEGE OF SCIENCE

# **9th International Purdue Symposium on Statistics**

Data Revolution:  
Opportunities and Challenges  
for Statistics

**June 5 - 8, 2018**  
**Purdue University**  
**West Lafayette, Indiana, U.S.**

Sponsors:

College of Science, Purdue University  
Discovery Park, Purdue University  
Institute for Global Security and Defense Innovation,  
(i-GSDI), Discovery Park, Purdue University  
Dow AgroSciences

<http://www.stat.purdue.edu/symp2018>



**Department of Statistics  
250 N. University Street  
Purdue University  
West Lafayette, IN 47904  
[www.stat.purdue.edu](http://www.stat.purdue.edu)**

**June 2018**

It is my great pleasure to welcome you to the beautiful campus of Purdue University in West Lafayette. The International Purdue Symposium on Statistics is an event that has been held every five years since the late 1960s in an effort to further the development of the field of Statistics. This year also marks the 50<sup>th</sup> Anniversary of the Department of Statistics.

The Department of Statistics became an independent entity in 1968 after it was formed in 1963 within the Division of Mathematical Sciences. The growth of the Department has been intimately tied to and influenced by the leadership of its former visionary department heads, Shanti Gupta (1968-1995), Mary Ellen Bock (1995-2010) and Rebecca Doerge (2010-2015). As a result, the Department is well positioned to be a leader in research and education in this big data era where a new paradigm and breakthroughs are needed to tackle data of massive quantity and complex structure. In your registration package, there is a brief history of the Department of Statistics written by Srivastava and Doerge (2013) with some supplementary materials written by me.

I would like to acknowledge the huge amount of effort by the Programing Committee and in particular Bruce Craig who co-chaired the Program Committee. My sincere appreciation also goes to Jim Berger who organized two memorial sessions in honor of Professor J. K. Ghosh, and to Anirban DasGupta who organized a memorial session in honor of Professor Herman Rubin. I am grateful to the plenary speakers, presenters and sponsors without whom this Symposium would not be possible. I also thank our dedicated staff members and in particular, Jesse Wallenfang and Holly Graef.

I hope you enjoy the Symposium and have a wonderful time in West Lafayette!

Hao Zhang  
Professor and Head of Statistics



Felix Haas Hall  
(courtesy of Purdue Marketing and Media)

# Plenary Speakers

Fowler Hall, Stewart (STEW) Center



James O. Berger  
The Arts and Sciences Professor of Statistics  
Department of Statistical Science, Duke University

## Encounters with imprecise probabilities

There is a Society of Imprecise Probability (<http://www.sipta.org/>). At their annual meeting last July, I gave this talk to illustrate some of the methods Bayesians use to deal with imprecise probability. The illustrations considered include dealing with interval valued probabilities, the p-value problem, optimal normal hierarchical Bayesian analysis, and uncertainty quantification of complex computer models. Many of the ideas behind Bayesian methods for dealing with imprecise probability arose from Herman Rubin, so this talk is also given in honor of his enduring legacy.

Wednesday, June 6  
8:30 - 9:30 a.m.



Peter Bühlmann  
Full Professor  
Department of Mathematics, ETH, Zürich

## Invariance, causality and novel robustness

Heterogeneity in potentially large-scale data can be beneficially exploited for causal inference and novel robustness. The key idea relies on invariance and stability across different heterogeneous regimes or sub-populations. What we term as "anchor regression" opens up new insights and connections between causality and protection (robustness) against worst case perturbations in prediction problems. We will discuss the methodology and some applications.

Thursday, June 7  
8:30 - 9:30 a.m.



Tony Cai  
Dorothy Silberberg Professor of Statistics  
The Wharton School at the University of Pennsylvania

## Statistical and Computational Limits for Submatrix Localization and Sparse Matrix Detection

In the conventional statistical framework, the goal is developing optimal inference procedures, where optimality is understood with respect to the sample size and parameter space. When the dimensionality of the data becomes large as in many contemporary applications, the computational concerns associated with the statistical procedures come to the forefront. A fundamental question is: Is there a price to pay for statistical performance if one only considers computable (polynomial-time) procedures? After all, statistical methods are useful in practice only if they can be computed within a reasonable amount of time.

Wednesday, June 6  
4:00 - 5:00 p.m.

In this talk, we discuss the interplay between statistical accuracy and computational efficiency in two specific problems: submatrix localization and sparse matrix detection based on a noisy observation of a large matrix. The results show some interesting phenomena that are quite different from other high-dimensional problems studied in the literature.

# Plenary Speakers

Fowler Hall, Stewart (STEW) Center



Guy Lebanon  
Director  
Machine Learning and AI, Amazon, Inc.

## **Being Smart with Art, News, and E-Commerce**

I will discuss several challenges that are of critical importance to the tech industry and currently receive little attention in the research community. Among these challenges are selection and composition of box-art images, producer-consumer marketplaces in newsfeeds, and modeling long-term effects in e-commerce. After presenting the challenges I will discuss several possible solutions, and ways in which the research community can help out.

Friday, June 8  
4:00 - 5:00 p.m.



Xihong Lin  
Henry Pickering Walcott Professor of Biostatistics and Chair  
Department of Biostatistics and Department of Statistics, Harvard University

## **Statistical Inference for Analysis of Massive Health Data: Challenges and Opportunities**

Massive 'ome data, including genome, exposome, and phenome data, are becoming available at an increasing rate with no apparent end in sight. Examples include Whole Genome Sequencing data, large-scale remote-sensing satellite air pollution data, digital phenotyping, and Electronic Medical Records. The emerging field of Health Data Science presents statisticians with many exciting research and training opportunities and challenges. Success in health data science requires strong statistical inference, integrated with computer science and information science. Examples include signal detection, network analysis, integrative analysis of different types and sources of data, and incorporation of domain knowledge in health data science method development. In this talk, I discuss some of the challenges and opportunities, and illustrate them using high-dimensional testing of dense and sparse signals for whole genome sequencing analysis, integrative analysis of different types and sources of data, and analysis of pleiotropy using biobanks and Electronic Medical Records (EMRs).

Thursday, June 7  
4:00 - 5:00 p.m.



Donald B. Rubin  
John L. Loeb Professor of Statistics  
Department of Statistics, Harvard University

## **Essential concepts of causal inference — a remarkable history**

I believe that a deep understanding of cause and effect, and how to estimate causal effects from data, complete with the associated mathematical notation and expressions, only evolved in the twentieth century. The crucial idea of randomized experiments was apparently first proposed in 1925 in the context of agricultural field trials but quickly moved to be applied also in studies of animal breeding and then in industrial manufacturing. The conceptual understanding seemed to be tied to ideas that were developing in quantum mechanics. The key ideas of randomized experiments evidently were not applied to studies of human beings until the 1950s, when such experiments began to be used in controlled medical trials, and then in social science — in education and economics. Humans are more complex than plants and animals, however, and with such trials came the attendant complexities of non-compliance with assigned treatment and the occurrence of "Hawthorne" and placebo effects. The formal application of the insights from earlier simpler experimental settings to more complex ones dealing with people, started in the 1970s and continue to this day, and include the bridging of classical mathematical ideas of experimentation, including fractional replication and geometrical formulations from the early twentieth century, with modern ideas that rely on powerful computing to implement aspects of design and analysis.

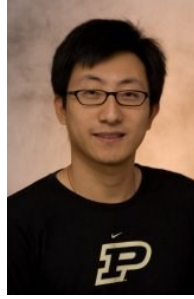
Friday, June 8  
8:30 - 9:30 a.m.



## Symposium Program Committee



Hao Zhang



Guang Cheng



Bruce Craig



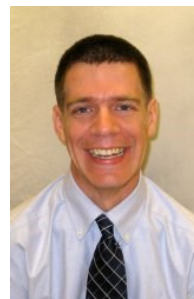
Chuanhai Liu



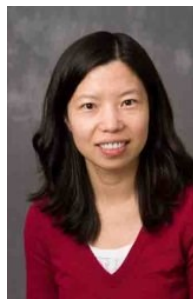
Raghu Pasupathy



Vinayak Rao



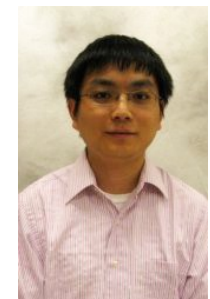
Mark Daniel  
Ward



Jun Xie

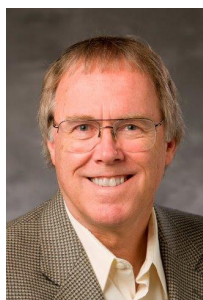


Dabao Zhang



Lingsong Zhang

## Symposium Advisory Committee



James O. Berger



Mary Ellen  
Bock



Rebecca W.  
Doerge



Patrick J. Wolfe

## Tuesday, June 5 - Workshop Schedule

7:30– 8:30 a.m. **Registration / Information\***

Outside of RAWL 2070 (Refreshments will also be available)

8:30– 11:30 a.m. **Workshops Part 1**

**Workshop 1: An Overview of Linear Mixed Models**

**(Chair: Bruce Craig)**

RAWL 2070

**Workshop 2: Introduction to Data Analysis for Big Data**

**(Chair: Mark Daniel Ward)**

RAWL 2058

**Workshop 3: Stochastic Optimization**

**(Chair: Raghu Pasupathy)**

RAWL 3058

**Workshop 4: Computing with Big Data: An Introduction to SupR**

**(Chair: Chuanhai Liu)**

RAWL 2082

11:30 am-1:00 pm Lunch Break (on your own)

1:00– 4:00 pm **Workshops Part 2** (same rooms as above)

\*Refreshments will be also be available from 2:00- 3:00 pm at registration desk

## Wednesday, June 6 - Symposium - Morning

7:30 am	<b>Registration/ Information Table</b> (open until 5 pm)	STEW East Foyer
8:20 - 8:30 am	<b>Opening Remarks:</b> <b>Patrick Wolfe, Frederick L. Hovde Dean of the College of Science</b>	Fowler Hall (STEW)
8:30 - 9:30 am	<b>Plenary Session</b> <i>Encounters with imprecise probabilities</i> <b>James Berger, Duke University</b> <b>Chair: Thomas Sellke, Purdue University</b>	Fowler Hall (STEW)
9:30 - 10:00 am	Break / Coffee	STEW 218
10:00 am - noon	<b>Morning Technical Sessions</b>	
	<b>SESSION 1: In Honor of John Deely</b> <b>Co-organizers: Bruce Craig, Purdue University and Wesley Johnson, University of California, Irvine</b> <b>Chair: Bruce Craig, Purdue University</b>	STEW 214 AB
10:00 - 10:30 am	Ronald Christensen, University of New Mexico <i>On Rereading Deely and Lindley</i>	
10:30 - 11:00 am	Purushottam Laud, Medical College of Wisconsin <i>Low Information Omnibus (LIO) Priors for Dirichlet Process Mixture Models</i>	
11:00 - 11:30 am	Wesley Johnson, University of California, Irvine <i>Some Thoughts on Objective Versus Subjective Bayes Factors for the Two Sample Comparison</i>	
11:30 am - 12:00 pm	James O'Malley, Dartmouth College <i>Modeling a Bivariate Residential-Workplace Neighborhood Effect when Estimating the Effect of Proximity to Fast-Food Establishments on Body Mass Index</i>	
	<b>SESSION 2: Statistical Developments in Analysis of Genomics Data for Disease Phenotype and Drug Response</b> <b>Organizer and Chair: Jun Xie, Purdue University</b>	STEW 214 CD
10:00 - 10:40 am	Ching-Ti Liu, Boston University <i>Genetic Fine Mapping Incorporating Functional Annotation: A Random Effects Approach</i>	
10:40 - 11:20 am	Wei Sun, Fred Hutchinson Cancer Research Center <i>Estimation of Intra-Tumor Heterogeneity and Assessing Its Impact on Survival Time</i>	
11:20 am - 12:00 pm	Yaowu Liu, Harvard University <i>Cauchy Combination Test: a Powerful Test with Analytic P-value Calculation under Arbitrary Dependency Structures</i>	

## Wednesday, June 6 - Symposium - Afternoon

**12:00 - 1:30 pm**     **Lunch Break** (on your own); for a list of local restaurants, please see: <https://www.yelp.com/c/west-lafayette-in-us/restaurants>. There are also several dining options available on the ground floor of the Memorial Union (PMU).

**1:30 - 3:30 pm**     **Afternoon Technical Sessions**

**SESSION 3: Statistical Challenges for National Security**     STEW 214 AB

**Co-organizers: Dan DeLaurentis, Purdue University and**

**Justin Newcomer, Sandia National Laboratory**

**Chair: Justin Newcomer, Sandia National Laboratory**

1:30 - 2:00 pm     Adam Cardinal-Stakenas, National Security Agency  
*Statistics Problems at NSA*

2:00 - 2:30 pm     Katherine Simonson, Sandia National Laboratories  
*One-Class Classifiers for National Security Applications*

2:30 - 3:00 pm     Kelly Avery, Institute for Defense Analyses  
*Statistical Design & Analysis Challenges in Defense Testing*

3:00 - 3:30 pm     Suresh Jagannathan, Purdue University  
*The Role of Academic Research at DARPA*

**SESSION 4: Big Data Theory and Computation**     STEW 214 CD

**Organizer: Guang Cheng, Purdue University**

**Chair: Shih-Kang Chao, Purdue University**

1:30 - 2:00 pm     Shih-Kang Chao, Purdue University  
*Diffusion Approximation to Stochastic Mirror Descent with Statistical Applications*

2:00 - 2:30 pm     Zijian Guo, Rutgers University  
*Semi-supervised Inference for Explained Variance in High-dimensional Linear Regression and Its Applications*

2:30 - 3:00 pm     Xiao Han, University of Southern California  
*A unified matrix model: the largest eigenvalue and its applications*

3:00 - 3:30 pm     Mingao Yuan, Indiana University - Purdue University Indianapolis  
*Likelihood Ratio Test for Stochastic Block Models with Bounded Degrees*

**3:30 - 4:00 pm**     **Break / Coffee**     STEW 218

*Continued on next page...*



## Wednesday, June 6 - Symposium - Afternoon (cont'd)

4:00 - 5:00 pm	<b>Plenary Session</b> <i>Statistical and Computational Limits for Submatrix Localization and Sparse Matrix Detection</i> Tony Cai, University of Pennsylvania Chair: Anirban DasGupta, Purdue University	Fowler Hall (STEW)
5:00 - 5:15 pm	Break	
5:15 - 6:30 pm	<b>Poster Session</b>	STEW 218

## Thursday, June 7 - Symposium - Morning

7:30 am	<b>Registration/ Information Table</b> (open until 5 pm)	STEW East Foyer
8:30 - 9:30 am	<b>Plenary Session</b> <i>Invariance, causality and novel robustness</i> Peter Bühlmann, ETH Zürich Chair: Xiao Wang, Purdue University	Fowler Hall (STEW)
9:30 - 10:00 am	Break / Coffee	STEW 218
10:00 am - noon	<b>Morning Technical Sessions</b>  <b>SESSION 5: Big Data in Plant Science I</b> Co-organizers: Min Zhang, Purdue University and Jianming Yu, Iowa State University Chair: Min Zhang, Purdue University	STEW 214 AB
10:00 - 10:30 am	Patrick Schnable, Iowa State University <i>The Potential of Predictive Plant Phenotyping to Address (some of) the Challenges Facing Crop Production</i>	
10:30 - 11:00 am	Alexander Lipka, University of Illinois at Urbana-Champaign <i>Quantification of Non-Additive Genomic Contributions towards Food and Energy-related Crop Traits</i>	
11:00 - 11:30 am	Tingting Guo, Iowa State University <i>From data mining to knowledge discovery: hidden relationships among genotype, phenotype, and environment</i>	
11:30 am - 12:00 pm	Mitch Tuinstra, Purdue University <i>Plant Breeding in the Omics Era</i>	
	<b>SESSION 6: Nonparametric Bayes: Big Models for Big Data</b> Organizer and Chair: Vinayak Rao, Purdue University	STEW 214 CD
10:00 - 10:30 am	Peter Mueller, University of Texas at Austin <i>Scalable Bayesian Nonparametric Clustering and Classification for EHR data</i>	
10:30 - 11:00 am	Long Nguyen, University of Michigan <i>Streaming dynamic and distributed inference of latent geometric structures</i>	
11:00 - 11:30 am	Sinead Williamson, University of Texas at Austin <i>Nonparametric models for structured sparse graphs</i>	
11:30 am - 12:00 pm	Steve MacEachern, Ohio State University <i>Aggregated Pairwise Classification of Shapes</i>	

## Thursday, June 7 - Symposium - Afternoon

**12:00 - 1:30 pm**     **Lunch Break** (on your own); for a list of local restaurants, please see: <https://www.yelp.com/c/west-lafayette-in-us/restaurants>. There are also several dining options available on the ground floor of the Memorial Union (PMU).

### **1:30 - 3:30 pm**     **Afternoon Technical Sessions**

#### **SESSION 7: Scalable Bayesian Methods for Large and Complex Data**

**Organizer and Chair: Anindya Bhadra, Purdue University**     STEW 214 CD

- 1:30 - 2:00 pm     Jeffrey Morris, MD Anderson Cancer Center  
*Bayesian Semiparametric Functional Mixed Models for Serially Correlated Functional Data, with Application to Glaucoma Data*
- 2:00 - 2:30 pm     Naveen Narisetty, University of Illinois at Urbana-Champaign  
*Scalable Bayesian approaches for quantile regression under censoring*
- 2:30 - 3:00 pm     Veronika Rockova, Chicago Booth  
*Posterior concentration for Bayesian regression trees and their ensembles*
- 3:00 - 3:30 pm     Questions and Discussion

#### **SESSION 8: Big Data in Plant Science II**

STEW 214 AB

**Co-organizers: Min Zhang, Purdue University and**

**Jianming Yu, Iowa State University**

**Chair: Jianming Yu, Iowa State University**

- 1:30 - 2:00 pm     Rebecca W. Doerge, Carnegie Mellon University  
*The Future of Statistical Bioinformatics and Genomics in the Automated World of Agriculture*
- 2:00 - 2:30 pm     Zhen Zhang, Dow AgroSciences LLC
- 2:30 - 3:00 pm     Min Zhang, Purdue University  
*Training and new statistical methods for big data in plant research*
- 3:00 - 3:30 pm     Karl W. Broman, University of Wisconsin-Madison  
*QTL analysis in multi-parent populations*

#### **SESSION 9: In Memory of Herman Rubin and His Contributions**

**Organizer and Chair: Anirban DasGupta, Purdue University**     STEW 202

- 1:30 - 2:10 pm     Rodrigo Bañuelos, Purdue University  
*A tale of three inequalities, conversations with Herman Rubin*  
  
*Continued on next page*

## Thursday, June 7 - Symposium - Afternoon (cont'd)

*Continued from previous page*

STEW 202

### **SESSION 9: In Memory of Herman Rubin and His Contributions**

2:10 - 2:50 pm Andrew L. Rukhin, National Institute of Standards and Technology, U.S.  
*Heterogenous Data and Objective Priors*

2:50 - 3:30 pm Rick Vitale, University of Connecticut  
*Two Papers with Herman*

**3:30 - 4:00 pm** Break / Coffee

STEW 218

**4:00 - 5:00 pm** **Plenary Session**

Fowler Hall (STEW)

***Statistical Inference for Analysis of Massive Health Data:***

***Challenges and Opportunities***

**Xihong Lin, Harvard University**

**Chair: Jun Xie, Purdue University**

## Friday, June 8 - Symposium - Morning

7:30 am	<b>Registration/ Information Table</b> (open until 3 pm)	STEW East Foyer
8:30 - 9:30 am	<b>Plenary Session</b> <i>Essential concepts of causal inference — a remarkable history</i> Donald Rubin, Harvard University Chair: Hao Zhang, Purdue University	Fowler Hall (STEW)
9:30 - 10:00 am	Break / Coffee	STEW 218
10:00 am - noon	<b>Morning Technical Sessions</b>  <b>SESSION 10: Jayanta K. Ghosh Memorial Session on Model Uncertainty</b> <b>Organizer and Chair: Jim Berger, Duke University</b>	STEW 214 AB
10:00 - 10:40 am	Malgorzata Bogdan, Wroclaw University of Science and Technology <i>Model selection and multiple testing - a journey with Jayanta K. Ghosh</i>	
10:40 - 11:20 am	Bertrand Clarke, University of Nebraska-Lincoln <i>Estimating the VC dimension with applications to model selection</i>	
11:20 am - 12:00 pm	Malay Ghosh, University of Florida <i>Bayesian multiple testing under sparsity</i>	
	<b>SESSION 11: Deep Neural Nets, Scalable Computing and Finance</b> <b>Organizer and Chair: Kiseop Lee, Purdue University</b>	STEW 202
10:00 - 10:30 am	Colm O'Kinneide, QS Investors LLC <i>Three theorems on risk contributions</i>	
10:30 - 11:00 am	Xiao Wang, Purdue University <i>Weight Normalized Deep Neural Networks</i>	
11:00 - 11:30 am	Faming Liang, Purdue University <i>Markov Neighborhood Regression for High-Dimensional Inference</i>	
11:30 am - 12:00 pm	Kylie Bemis, Northeastern University <i>Scalable R computing with big data-on-disk for bioinformatics and beyond</i>	
	<b>SESSION 12: Precision Medicine</b> <b>Organizer: Lingsong Zhang, Purdue University</b> <b>Chair: Arman Sabbaghi, Purdue University</b>	STEW 214 CD
10:00 - 10:40 am	Guanhua Chen, University of Wisconsin <i>Constructing Stabilized Dynamic Treatment Regimes</i>  <i>Session continued on next page...</i>	

## Friday, June 8 - Symposium - Morning (cont'd)

### **SESSION 12: Precision Medicine - continued**

STEW 214 CD

10:40 - 11:20 am

Bruce Craig, Purdue University

*Distance Weighted Discrimination Approach for Precision Medicine*

11:20 am - 12:00 pm

Haoda Fu, Eli Lilly and Company

*Individualized Treatment Recommendation (ITR) for Survival Outcomes*

## Friday, June 8 - Symposium - Afternoon

**12:00 - 1:30 pm**

**Lunch Break** (on your own); for a list of local restaurants, please see:

<https://www.yelp.com/c/west-lafayette-in-us/restaurants>. There are also several dining options available on the ground floor of the Memorial Union (PMU).

**1:30 - 3:30 pm**

**Afternoon Technical Sessions**

**SESSION 13: Divide & Recombine with DeltaRho R &**

STEW 202

**Hadoop for Big Data Analysis**

**Organizer and Chair: William S. Cleveland, Purdue University**

1:30 - 2:10 pm

William S. Cleveland, Purdue University

*Divide & Recombine (D&R) with DeltaRho for Big Data Analysis*

2:10 - 2:50 pm

Wen-wen Tung, Purdue University

*DeltaRho for Deep Analysis of Atmospheric Convection and Precipitation to Advance the Understanding of Earth's Water Cycle*

2:50 - 3:30 pm

Aritra Chakravorty, Purdue University

*Introduction to Embarrassingly Parallel Statistics and its applications for computation of Quantiles and KD-trees for large data via Divide and Recombine method*

**SESSION 14: Jayanta K. Ghosh Memorial Session on Bayesian**

**Nonparametrics, Empirical Processes, and Convexity**

STEW 214 AB

**Organizer: James Berger, Duke University**

**Chair: R.V. Ramamoorthi, Michigan State University**

1:30 - 2:10 pm

Anirban DasGupta, Purdue University

*Empirical Processes, Clustering, Convexity, and Variational Diameters*

*Continued on next page*



## Friday, June 8 - Symposium - Afternoon (cont'd)

**SESSION 14: Jayanta K. Ghosh Memorial Session on Bayesian Nonparametrics, Empirical Processes, and Convexity**      STEW 214 AB  
continued

2:10 - 2:50 pm      Subhashis Ghosal, North Carolina State University  
*Bayesian mode and maximum estimation and accelerated rates of contraction*

2:50 - 3:30 pm      Surya Tokdar, Duke University  
*Semi-parametric density estimation with logistic Gaussian processes*

**SESSION 15: Probabilistic Machine Learning and Modern Statistics**  
**Organizer and Chair: Vinayak Rao, Purdue University**      STEW 214 CD

1:30 - 2:00 pm      Babak Shahbaba, University of California at Irvine  
*Dynamic Bayesian Models for Neural Data Analysis*

2:00 - 2:30 pm      Jean Honorio, Purdue University  
*Learning linear structural equation models in polynomial time and sample complexity*

2:30 - 3:00 pm      Qiang Liu, University of Texas at Austin  
*A Stein variational framework for deep probabilistic modeling*

3:00 - 3:30 pm      Bharath Sriperumbudur, Pennsylvania State University  
*On Approximate Kernel PCA Using Random Features:  
Computational vs. Statistical Trade-off*

**3:30 - 4:00 pm**      Break / Coffee      STEW 218

**4:00 - 5:00 pm**      **Plenary Session**      Fowler Hall (STEW)  
*Being Smart with Art, News, and E-Commerce*  
**Guy Lebanon, Amazon Inc.**  
**Chair: Bruce Craig, Purdue University**

**6:00 - 11:00 pm**      **50th Anniversary Reception and Banquet**  
Purdue Memorial Union (PMU) South Ballroom

# Symposium Program At-A-Glance

## Tuesday, June 5 — Workshops

7:30– 8:30 am	<b>Registration:</b> outside of RAWL 2070
8:30–11:30 am	<b>All Workshops Part 1</b> Workshop 1: RAWL 2070 Workshop 2: RAWL 2058 Workshop 3: RAWL 3058 Workshop 4: RAWL 2082
11:30 am–1:00 pm	Lunch on your own
1:00– 4:00 pm	<b>All Workshops Part 2</b>

## Wednesday, June 6 — Sessions

7:30 am– 5:00 pm	<b>Registration/ Information</b> table: STEW East Foyer
8:20– 9:30 am	<b>Opening Remarks and Plenary Session:</b> <b>Fowler Hall, STEW</b>
9:30– 10:00 am	Break - STEW 218
10:00 am– noon	Session 1: STEW 214 AB Session 2: STEW 214 CD
noon– 1:30 pm	Lunch Break (on your own)
1:30– 3:30 pm	Session 3: STEW 214 AB Session 4: STEW 214 CD
3:30– 4:00 pm	Break - STEW 218
4:00– 5:00 pm	<b>Plenary Session:</b> <b>Fowler Hall, STEW</b>
5:00– 5:15 pm	Break
5:15– 6:30 pm	<b>Poster Session: STEW 218</b>

## Thursday, June 7 — Sessions

7:30 am– 5:00 pm	<b>Registration/ Information</b> table: STEW East Foyer
8:30– 9:30 am	<b>Plenary Session:</b> <b>Fowler Hall, STEW</b>
9:30– 10:00 am	Break - STEW 218
10:00 am– noon	Session 5: STEW 214 AB Session 6: STEW 214 CD
noon– 1:30 pm	Lunch Break (on your own)
1:30– 3:30 pm	Session 7: STEW 214 CD Session 8: STEW 214 AB Session 9: STEW 202
3:30– 4:00 pm	Break - STEW 218
4:00– 5:00 pm	<b>Plenary Session:</b> <b>Fowler Hall, STEW</b>

## Friday, June 8 — Sessions

7:30 am– 3:00 pm	<b>Registration/ Information</b> table: STEW East Foyer
8:30– 9:30 am	<b>Plenary Session:</b> <b>Fowler Hall, STEW</b>
9:30– 10:00 am	Break - STEW 218
10:00 am– noon	Session 10: STEW 214 AB Session 11: STEW 202 Session 12: STEW 214 CD
noon– 1:30 pm	Lunch Break (on your own)
1:30– 3:30 pm	Session 13: STEW 202 Session 14: STEW 214 AB Session 15: STEW 214 CD
3:30– 4:00 pm	Break - STEW 218
4:00– 5:00 pm	<b>Plenary Session:</b> <b>Fowler Hall, STEW</b>
6:00– 11:00 pm	<b>50th Anniversary Reception and Banquet: Purdue Memorial Union (PMU) South Ballroom</b>

### Important Details:

- Guest wireless accounts are included with your registration materials
- Please wear your Symposium badge at all times
- Please do not leave valuables unattended
- Refreshments are available Wednesday - Friday in STEW 218 at the following times:  
7:30 - 8:30 a.m., 9:30 - 10:00 a.m., and 3:30 - 4:00 p.m.
- Online Symposium Program with titles and abstracts for all sessions, workshops, and posters can be found on our website: <http://www.stat.purdue.edu/symp2018.html>