

## 2017 Mathematical Contest in Modeling® Press Release—April 7, 2017

COMAP is pleased to announce the results of the 33rd annual Mathematical Contest in Modeling (MCM). This year, 8843 teams representing institutions from thirteen countries participated in the contest. Thirteen teams from the following institutions were designated as OUTSTANDING WINNERS:

**Chongqing University of Posts and Telecommunications, China**  
**Nanjing University, China (Ben Fusaro Award)**  
**Nanjing University of Posts and Telecommunications, China**  
**(SIAM Award)**  
**Neijiang Normal University, China (INFORMS Award)**  
**North Carolina State University, NC, USA**  
**(SIAM Award & MAA Award)**  
**Shandong Normal University, China (Frank Giordano Award)**  
**Shanghai Jiao Tong University, China (4)**  
**(INFORMS Award 55280 & INFORMS Award 55583)**  
**Southwestern University of Finance and Economics, China**  
**The University of Hong Kong, Hong Kong (SAR)**  
**University of California at Berkeley, CA, USA (MAA Award)**

This year's contest ran from Thursday, January 19 to Monday, January 23, 2017. During that time, teams of up to three undergraduate or high school students researched, modeled, and submitted a solution to one of three modeling problems. The 2017 MCM was primarily an online contest. Teams registered, obtained contest materials, and downloaded the problem and data at the prescribed time through COMAP's MCM Website.

This year, the three MCM problems represented interesting scenarios for contestants, each offering a dimension of mathematical modeling that was unique. The authors of problems A, B, and C are Dr. Kelly Black, Dr. Michael Tortorella, and Professor David Olwell, respectively.

Problem A addressed options associated with a dam in the Kariba Gorge of the Zambezi river basin between Zambia and Zimbabwe that is suffering from aging effects which potentially threaten the safety of downriver populations. Teams were challenged to provide an overall assessment of three options and then delve into a detailed modeling and analysis of a replacement scheme in which multiple smaller dams would be constructed to replace the existing dam. Lifecycle costs, electrical power generation, water management policies, and environmental impacts were among the problem characteristics that teams were required to address. This was a particularly thought-provoking problem with multiple avenues along which teams could become lost if not careful.

The B problem revisited an issue that time, technology, and engineering have yet to resolve to satisfaction – diffusion and convergence of multi-lane traffic on two sides of a highway toll collection facility. However,

rather than posing a situation in which performance assessment of a particular configuration was sought, problem B instead asked teams to consider if there existed some yet unidentified design that offered improved performance in comparison to existing designs. While challenging in its own right, added complexity was introduced by asking teams to consider the impact of self-driving vehicles, human versus automatic toll collectors, and surges of heavy traffic.

Finally, the C problem asked teams to assess the impact of self-driving vehicles on a particularly dense traffic network in the Greater Seattle area. As with previous C problems, a significant amount of real world data was provided for team use in determining patterns and insights upon which they might construct a mathematical model to analyze the effects on traffic flow of the number of lanes, peak and/or average traffic volume, and percentage of vehicles using self-driving, cooperating systems. As in past years, teams submitted clever and insightful approaches that judges found fascinating.

A selection from the Outstanding solution papers will be featured in *The UMAP Journal*, along with commentaries from the problem authors and judges. All 8843 of the competing teams are to be congratulated for their excellent work and enthusiasm for mathematical modeling and interdisciplinary problem solving.

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### 2017 MCM Statistics

- **8843 teams participated**
- **2409 Problem A (27%)**
- **4907 Problem B (56%)**
- **1527 Problem C (17%)**
- **311 US Teams (3%)**
- **8532 Foreign Teams (97%) from Australia, Canada, China, Hong Kong SAR, Indonesia, Macau SAR, Mexico, Republic of Korea, Scotland, Singapore, South Africa and United Kingdom**
- **13 Outstanding Winners (1%)**
- **23 Finalist Winners (1%)**
- **651 Meritorious Winners (7%)**
- **3539 Honorable Mentions (40%)**
- **4467 Successful Participants (49%)**
- **30 Unsuccessful Participants (1%)**
- **120 Disqualified (1%)**

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To obtain additional information about the MCM and to obtain a complete listing of all team designations, please visit the MCM Website at: [www.mcmcontest.com](http://www.mcmcontest.com), or contact COMAP at: [mcm@comap.com](mailto:mcm@comap.com).

*Major funding for the MCM is provided by COMAP. Additional support is provided by the Institute for Operations Research and the Management Sciences (INFORMS) and Two Sigma Investments. COMAP's Mathematical Contest in Modeling and Interdisciplinary Contest in Modeling are unique among modeling competitions in that they are the only international contests in which students work in teams to find a solution. Centering its educational philosophy on mathematical modeling, COMAP uses mathematical tools to explore real-world problems. It serves the educational community as well as the world of work by preparing students to become better informed—and prepared—citizens, consumers, and workers.*

#### Contest Director

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