

# Minutes of Monthly Webinar No. 1:

## *INFORMS RAS · 2020 Problem-Solving Competition*

March 20, 2020 · 9:00 AM EDT

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### **RAS Attendance:**

Krishna Jha (Host / Problem Owner) · Jay Baillargeon (Problem-Solving Competition Chair) · Nathaniel Richmond (RAS Chair) · Steve Tyber (RAS Vice-Chair)

### **Agenda:**

- Welcome & Introductions
- Problem Statement Background
- Open Forum for Participants' Q&A
- Adjourn (Next Monthly Webinar: **Friday, April 17, 2020**)

### **Conference Call / Zoom Webinar:**

- Jay Baillargeon and Krishna Jha introduced themselves and welcomed those who attended the first monthly webinar for the 2020 INFORMS RAS Problem-Solving Competition and noted that, while the monthly webinar is a new addition to the annual competition, the goal is to provide an open forum to gather feedback for the problem at hand from the RAS community as well as address questions from participants.
- Mr. Jha then proceeded to give a brief introduction to the problem statement selected for this year's competition, including some background information regarding the selection of the problem and how it relates to the freight railroad industry in the U.S.
  - Mr. Jha noted that this is one area in which freight railroads have not been able to firmly handle and, while larger (e.g., Class I) railroads have the resource to tackle this issue, accuracy of train travel-time estimation continues to be an issue due to various reasons and, as such, researcher still struggle with this problem.
  - Given this, it makes for a very challenging problem and ideal for the RAS Problem-Solving Competition. In addition, the current state of the industry is advantageous for solving a problem such as this for two reasons: (1) positive train control, or PTC, brings about a significant amount of useful data for the U.S. freight railroad industry, and (2) it is not simply an optimization problem; solving this problem requires a hybrid approach that brings together data science and machine learning.
- Following Mr. Jha's introduction and background, Mr. Baillargeon opened the forum for questions, comments, and any discussion related to the draft problem statement as posted on the website. This brought about the following questions:
  - **How large will the dataset be?**
    - Mr. Jha responded that there will be two datasets: (1) an initial dataset to be used for debugging, which will likely be small (i.e., only a handful of trains and small section of track); and (2) the actual dataset, which will be more elaborate (i.e, a

larger corridor of perhaps 120 miles, over which a few hundred trains will be operating).

- Mr. Baillargeon also noted that the committee is still in the process of acquiring the data from an industry partner, so there are no specific details available as of yet regarding the datasets.
- A follow-up question later in the forum asked, “**What will be the size of the sample dataset?**” In response, Mr. Jha noted the dataset will be small enough to be handled by hand, but the committee is still working with an industry partner for acquiring the data. This data set will be released on **Friday, April 3, 2020**, with the final version of the problem statement.
- **With regard to the running time for the solution developed, while it may be short for a smaller dataset, it may increase significantly with a large dataset. As such, what should participants aim for?**
  - Mr. Baillargeon noted that, prior to final submissions, there will be a validation period and likely a rubric from which runtime can be defined if it is a continued concern.
- **How will the network be presented visually? Will a diagram be developed for the network?**
  - Jointly, Mr. Jha and Mr. Baillargeon noted that, while the network will certainly be presented numerically for implementation into the proposed problem, there will likely be some type of visual representation of the network as well, though this will be dependent upon what is received from the committee’s industry partner(s).
- **How will the incremental change be shown?**
  - Mr. Jha responded that the data will show numerically this incremental change in train travel times.
- **In the problem statement, it states, “A bonus feature of the solution approach can also be its adaptation for the incremental train travel-time estimation.” Is this a sub-question of the overall problem, or simply a suggestion?**
  - Mr. Jha confirmed that this is just a suggestion, not a sub-question.
  - He also added that, in the real world, there will be any number of changes occurring that will inevitably effect train travel times. As such, bonus points will be given for tackling the incremental approach.
- **Are there any recommendations for the coding language to be used?**
  - Mr. Jha noted that this is unimportant for this competition; that is, other aspects of the competition (e.g., creativity and elegance of the solution developed) should be a higher priority than the coding language.

### Action Items:

- None