

# Evaluation of Deception For The Greater Good: Minimizing Traffic Congestion With Information Design

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## Abstract

The paper *Reducing Congestion Through Information Design* which is reviewed in the report *Deception For The Greater Good: Minimizing Traffic Congestion With Information Design* we are going to evaluation in this article, deals with the problem of suboptimal decisions of Bayesian agents in the context of games with uncertain congestions when given complete information of the system. The reviewing group developed and used a simulation software to replicate the results seen in the aforementioned paper. Their work and its presentation are evaluated in the first section of this article while remarks can be found in the second section.

## 1 EVALUATION

As we deal with three different texts throughout this evaluation it might help to assign to each of them a unique name. Therefore, if we speak of the *paper* we mean the original work by Das et al (2017) titled *Reducing Congestion Through Information Desig*. The *report* denotes the review on the aforementioned paper and is titled *Deception For The Greater Good: Minimizing Traffic Congestion With Information Design* written by Kaïs Albichari, Raymond Lochner, Rodrigue Van Brande and Tanguy d'Hose. Lastly we will say the *article* when speaking about the evaluation you are reading right now.

The article is organized into two parts. In this one, apart from clarifying notation, we will evaluate the different sections of the report on the basis of the questions from the specification found online and the mail the report was attached to. The second part will provide overall general positive and negative remarks as well as questions on the content of the report.

## 1.1 ABSTRACT AND INTRODUCTION

Todo: Evaluate whether the introduction explains clearly the content of the paper ✓

The abstract should be more elaborated in terms of what the paper is about. Also using the term *agent* both for the entity being routed and a potential supervisory structure (mis)leading the former might be confusing. An interested reader might now, after having read the abstract, have a vague idea of the topics that are about to be discussed. We don't immediately see however why selfishness of agents in a traffic system is a motivation for the study.

The introduction provides a clear overview of the topics to be discussed but contains spelling mistakes, as does the abstract. Since this is the first impression the reader gets, we highly recommend to review the phrasing. Subsequently, the second paragraph states that the work is a 'very active topic' but the references that back up this claim are from the same author and date back to 2005. While 2005 is clearly a lot more recent than 1920, the year it is referring to, it would be good to find a more recent paper (e.g. the one that is actually being reviewed) or to remove the claim.

Otherwise the paper is well summarized, touching on all the major parts without getting carried away, so the reader feels confident to dive in. It could be a little clearer though that the report is mainly a reproduction and revisit of the original content rather than something completely novel.

## 1.2 BACKGROUND INFORMATION

Todo: Evaluate whether there is sufficient background information to understand the relevance of the work ✓

The sources cited in the introduction are sufficient to understand the relevance of the work, spanning both time and topics. There is one highly influential reference added to those already present in the paper, Pigou (1920), but it remains the only one. Citing sources encapsulated in parenthesis when introducing them directly is uncommon. Strangely, *Informational Braess' paradox: The effect of information on traffic congestion* (Acemoglu et al, 2016) is cited as being published in 2017 in the paper, though 2016 seems to be correct.

## 1.3 METHODS

Todo: Evaluate whether the methods are clearly explained (can the results be reproduced?)

## 1.4 RESULTS

Todo: Evaluate whether the results answer the questions asked in the paper (which

questions?)

## 1.5 QUESTIONS

Todo: Evaluate whether all questions asked in the paper are answered (which questions?)

1. How can providing partial information to agents in a routing game improve outcomes and restore efficiency?
  - In a simple example
  - In the *Wheatstone Network*
2. How to deploy network information to minimize congestion?

## 1.6 CONCLUSION

Todo: Evaluate whether the conclusion is sufficient ✓

An actual conclusion is entirely missing. The report is not summarized at all but there is an outlook paragraph as part of the discussion. The discussion on the other hand is missing any reference to, and explanation of, the obtained results. While the naming of the concluding section has neither to be *Discussion* nor *Conclusion*—though this definitely is a fairly standardized naming convention—the content of those sections has to appear somewhere in the work.

## 1.7 STYLE

Todo: Evaluate whether the overall style is ok ✓

The overall style of the article is somewhat of a mixed bag. While the formulas and the text are nicely typeset, using subsections and paragraphs to increase readability, there are a lot of idiomatic and expressive flaws and spelling mistakes. The citation style is very unusual and inconsistent. Many variable names are reassigned to new purposes multiple times (e.g.  $P_i$  being first a path name, then the argument to the cost function  $c(\cdot)$ —previously taking the share of agents  $x$  on a path also called  $s_i$  later while  $s$  is additionally a node in the directed graph—and then it becomes the path cost function itself) making it hard to follow the mathematical reasoning. The figures are informative and clear though the labeling of figure 2 is too small.

## 1.8 MISSING CONTENT

Todo: Evaluate whether you believe things are missing in the discussion ✓?

As already mentioned in subsection 1.6, the obtained results are not thoroughly discussed. Here and there, scatter throughout what seems to be the result section(s), explanatory sentences are to be found. There is however no clear and final overview of the obtained

results, explaining their meaning and comparing them to those published in the original work.

## 2 REMARKS

In this section we will discuss possible ways to improve the report on the basis of some specific positive and negative examples as well as content wise questions.

### 2.1 POSITIVE

Todo: Name 3 positive points concerning the work, clearly specifying why you think they are well-done or interesting

### 2.2 NEGATIVE

Todo: Name 3 negative points, which may include missing/unclear explanations or suggestions for improvement

### 2.3 QUESTIONS

Todo: Name at least 3 clear and relevant questions on the content or the methods used which can be asked (next to other questions)