

# Modeling and Analysis of Data Corruption Attacks and Energy Consumption Effects on Edge Servers using Concurrent Stochastic Games

## Reply to the Editor and Reviewers' Comments Soft Computing

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We express our gratitude to the reviewers and the Editor-in-Chief of Soft Computing for their valuable comments and constructive suggestions during the first round of review. Their input has significantly contributed to the enhancement of our manuscript. In this revised version, we have addressed the various comments and provided detailed responses to the inquiries the Editor and Reviewers raised. Following the structure of the received email for revision, we have provided comprehensive answers to each question and comment. The modifications made to the updated manuscript are highlighted in blue.

### Comments from Reviewer #1

**Comment 1:** I have reviewed the manuscript Modeling and Analysis of Data Corruption Attacks and Energy Consumption Effects on Edge Servers using Concurrent Stochastic Games. Next, I share my comments.

**Answer:** We sincerely appreciate the positive feedback and valuable comments provided, which have greatly contributed to the improvement of our contribution. With regard to the updated version, we firmly believe that we have effectively addressed the various concerns, as evidenced by the implemented changes.

**Comment 2:** In the abstract, please include the main numerical results.

**Answer:** Thank you for the review. We included the numerical results in the abstract to provide a concise overview of our findings.

**Comment 3:** The manuscript must be reorganized. In the introduction, or after this section, the related works must be presented in order to support and clarify the main contribution of the work, and after that, the outline must be included. After that, the problem must be clearly presented, and the proposed approach for its solution.

**Answer:** Thank you for your review. We have reorganized the document to enhance clarity. In the new version, the paper’s intent is no longer foreshadowed in the introduction. Instead, the paper’s intent is presented after the outline section. Additionally, the related works section now follows the introduction to provide a deeper understanding of the survey’s context.

**Comment 4:** Preliminaries section must be included as Supplementary material.

**Answer:** We appreciate your review of the manuscript. In response to your feedback, we have moved the content of the Preliminaries section to the supplementary material, which can be found in Appendix A.

**Comment 5:** All equations must be numbered.

**Answer:** Thank you for your review. We have addressed your feedback regarding equation numbering. All equations in the manuscript are now consecutively numbered throughout the text.

**Comment 6:** Results must be compared with other ones previously reported in the literature.

**Answer:**

- Section 7.2.2 presents additional experiments that analyze both energy consumption and the scalability achieved through our verification approach. Furthermore, section 7.2.3 explores the effectiveness of mitigation strategies in reducing energy consumption.
- Our work represents the first application of CSG to model attacks and mitigation strategies specifically for the purpose of minimizing energy consumption.
- The existing research like [1], proposes an ensemble-based framework for botnet detection in IoT networks using machine learning. Our method incorporates user interaction within a closed-loop system to mitigate attacks and optimize energy consumption through the application of mathematical formalism. This paragraph is portrayed in the Discussion section.

[1]: Jincheng Zhou et al. A lightweight energy consumption ensemble-based botnet detection model for IoT/6G networks. Sustainable Energy Technologies and Assessments. 2024. <https://doi.org/10.1016/j.seta.2023.103454>