Ohio College Summer Research Symposium

**Abstract Submission Template**

**Abstract must be received by July 20, 2018**

-Instructions- PLEASE READ

Note: This template is based on the contributed talk abstract used by the *American Physical Society*.

1. Do not alter this template.
2. Anything typed outside the “Replace this text with your abstract title/body” area will be ignored.
3. For scientific equations, use only standard characters or Microsoft Equations Objects.
4. If you wish to embed a webpage, use the “Insert Hyperlink” function within Microsoft Word.
5. Do not insert Charts or Images into the abstract.
6. Add your title after the “title” delimiter, the authors’ information after the “authors” delimiter, and the abstract after the “abstract” delimiter.
7. Do not alter the fonts or size/color of the text.
8. There is a limit of 1300 characters.
9. Please save this file as either a Microsoft Word document (.doc or .docx format) or in rich-text format (.rtf file).
10. **Please email your completed abstract as an attachment to Robert Haring-Kaye at** [**rakaye@owu.edu**](mailto:rakaye@owu.edu)**.**

Check one: Talk \_\_ Poster √

Title: Artificial Intelligence for the Board Game Pandemic

Authors: Eugene Kramskoi, Dept. of Mathematics and Computer Science, Ohio Wesleyan University; Mira Jacobs, School of Engineering and Computer Science, Syracuse University; Sean McCulloch, Dept. of Mathematics and Computer Science, Ohio Wesleyan University

Abstract: Pandemic is a co-operative board game where two to four players are given the task of curing all four of the diseases that plague the forty-eight interconnected cities on the board’s map. The players must work together to travel from city to city and prevent the diseases from spreading while simultaneously researching a cure. There has been little research done on intelligent agents for European-style board games such as Pandemic. The goal of this research is to create a program that will intelligently play the board game Pandemic, and in the process learn about the algorithms and other challenges that an automatic player program for this type of game introduces. We have created a program that enforces the rules of the game and allows a combination of both human and computer players to play. Our computer player works by executing the most effective plan out of a list of generated possible abstract plans, where a plan is an abstract notion of a combination of smaller moves. To evaluate the effectiveness of plans, the program calculates how each plan would influence the time until loss and the time until win. These two metrics are approximations of the amount of turns that it would take the players to win or lose respectively. Time until loss is calculated by simulating the game so as to count how many turns it would take to lose if the players didn’t do any actions. Time until win is calculated by using probability to get the average time it would take execute a plan that would cure all the diseases.