SmartState

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Event-driven MachinE Learning, Intelligent Assessor (EMELIA)

- Intelligent neural network that will assist the failure reporting by analyzing and categorizing these reports
- Machine learning solution that can be trained using a large database of human-classified data related to failures
- Effectively analyze and predict new failure cases

Sponsor: General Dynamics

Who is this project being developed for?

RESCUE 21

- Advanced command, control and direction-finding communications system
  - Used to better locate mariners in distress, save lives and property

- System Features
  - Direction-finding capability for vessels in distress: First Responders
  - Allows for transmission of location with the push of a button
  - Geographic display to identify hoax callers
  - Simultaneous monitoring and relaying of information over multiple frequencies
  - Automated transmission of urgent marine information broadcasts

What is the value for this project?

EMELIA is meant to help classify system and hardware failures... more on that later.

- As with all systems, there are failures...
  - Tickets are generated to provide information regarding system failures
  - Failures tracked in these tickets/reports are the primary way for engineers to interact with failures and document outages
  - Our task is to utilize these generated failure reports to classify the failures so that engineers no longer have to do that by hand

Functionality of EMELIA

What will it do?: Process "tickets" and *develop patterns*

Predict: From those patterns, classify into a few *Well-Defined* categories that multiple tickets will fall into.

Goal: an intelligent, retainable solution based on an existing architecture, that will be able *correctly categorize* tickets via textual analysis into *predefined* categories with an accuracy of 90% with a new dataset.

Initial Minimal Viable Product Overview

- Able to pull from a (growing) database of previously classified failure cases to train an appropriate machine-learning classifier
- Once trained, able to effectively classify new failure cases with a high degree of accuracy
- Some sort of basic test harness to make it easy to explore system performance, i.e., can change various parameters (training set, feature set, target set to classify, etc.) and then run the classifier on the target set, recording its accuracy, speed, etc. The idea is to get an idea of what feature sets are most relevant for accurate classification, and how many training cases are needed to reach a certain degree of classification accuracy

References

GNMS:General Dynamics Mission Systems

Links:

https://gdmissionsystems.com

https://gdmissionsystems.com/en/communications/rescue-21

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