LoTuS

Description
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LoTuS is a tool for Learning Temporal logic Specifications.
It contains three families of algorithms for:
1) Supervised Learning
2) Online Learning
3) Clustering
Every algorithm induces a Decision Tree that can be mapped to an STL formula.

Download
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Version 5.0 – [[download](https://drive.google.com/file/d/1RRCP7mwHrw2IvGXV2C49fugiPBoVDXLS)](https://drive.google.com/file/d/1RRCP7mwHrw2IvGXV2C49fugiPBoVDXLS/edit)

Installation
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To install the package, just run `LoTuS\_Init.m` script first.

Information about the dataset format is contained in `CaseStudies/Dataset\_Info.md`.
Sample execution scripts are included in `CaseStudies/` and in the `ExecScripts/` folder.

Requirements
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This software has been tested with MATLAB R2020a on Windows 10.
However, it SHOULD work on any recent version of MATLAB/OS.
It requires the Optimization Toolbox and Signal Processing Toolbox.
Other third party libraries are included in the `ThirdParty/` directory.

Acknowledge this work
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To cite this work please use:
1. G. Bombara and C. Belta, “Offline and Online Learning of Signal Temporal Logic Formulae using Decision Trees” in ACM Transactions on Cyber-Physical Systems, Vol 5, No 3, March 2021, doi: 10.1145/3433994
2. G. Bombara and C. Belta, “Signal Clustering Using Temporal Logics” in Runtime Verification, Sep. 2017, pp. 121–137, doi: 10.1007/978-3-319-67531-2\_8