



Knight Foundation
School of Computing
and Information Sciences

FIU Knight Foundation School of Computing and Information Sciences

Summer 2021 Senior Design Project

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MITRE



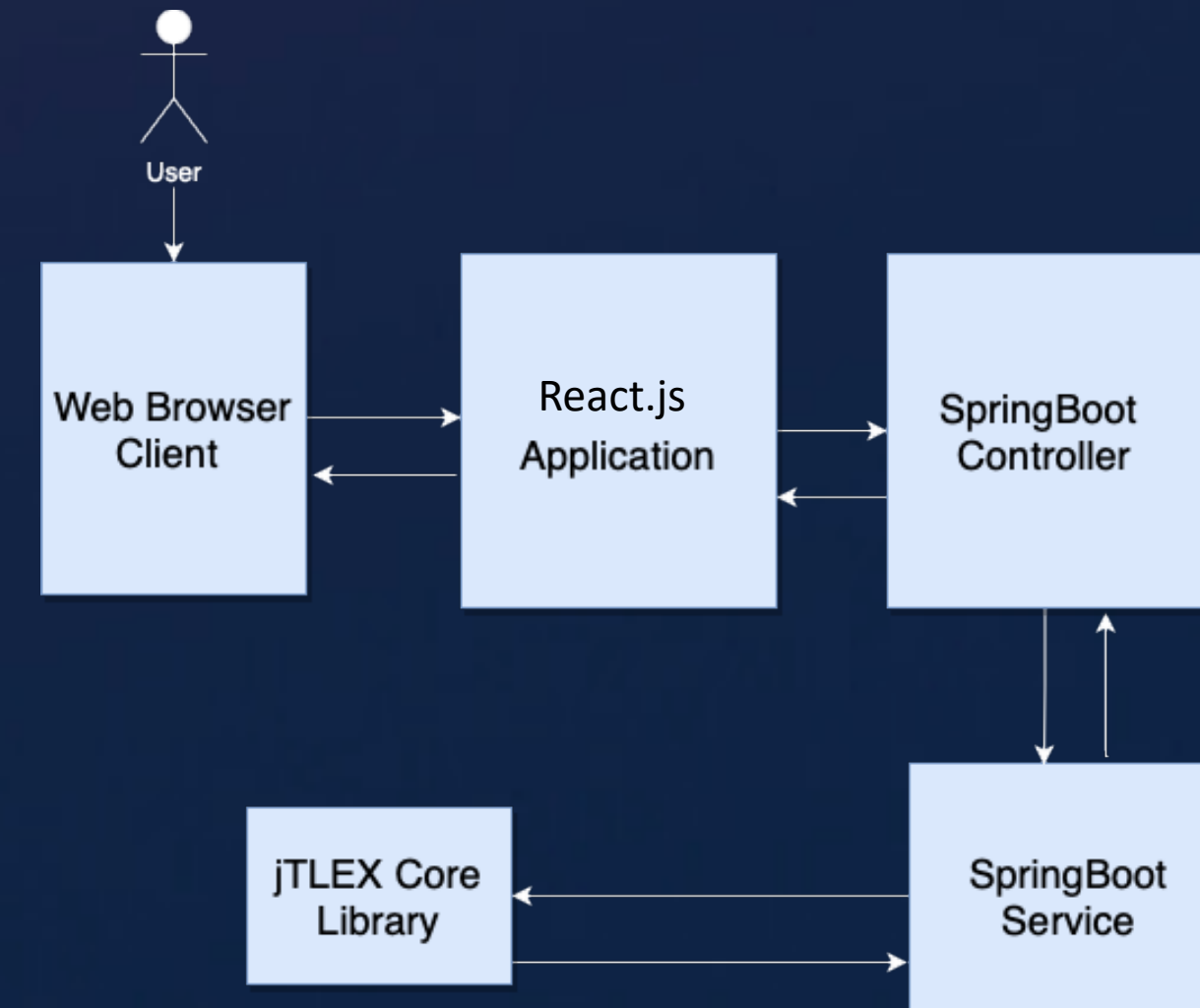
PROBLEM

Qualitative temporal graphs that are derived from annotations on text (TimeML annotations) explicitly reveal only the partial orderings of events and times. For many purposes, however, a total ordering (a timeline) is more useful.

Timelines are rarely explicit in text, and usually cannot be extracted directly. The TLEX algorithm specifies an exact, end-to-end solution, to the task of extracting multiple timelines from TimeML annotated texts. TLEX transforms TimeML annotations into a collection of main and subordinated timelines arranged into a trunk-and-branch style structure.

jTLEX is the implementation of the TLEX algorithm into an easy-to-use Java library. With it, a Web application called **TLEX: Timeline Extraction**, was created where annotated text from TimeML files or the files themselves can be uploaded for.

SYSTEM DESIGN



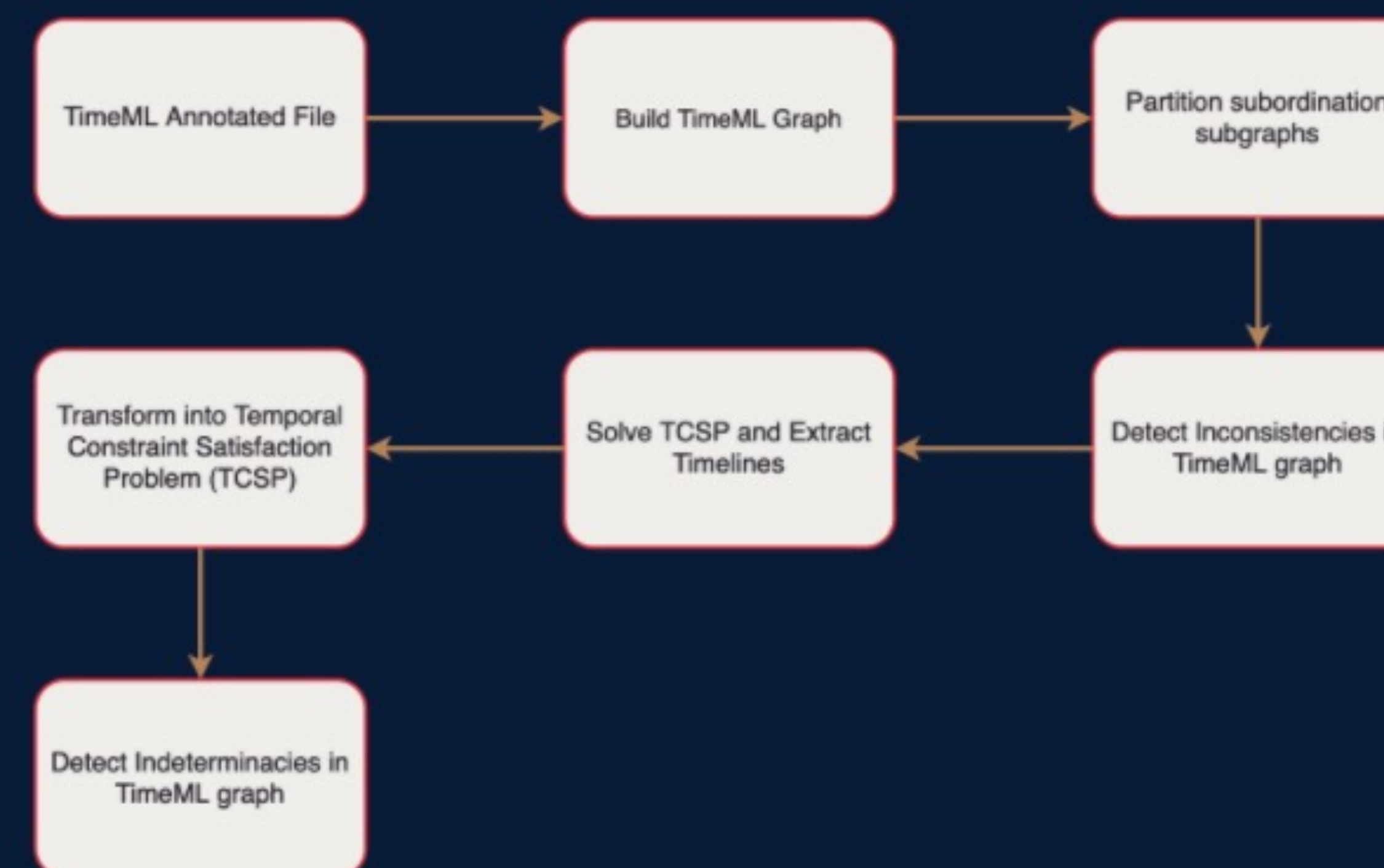
VERIFICATION

Test File	Purpose	Method	Preconditions (Input)	Expectation	Result
(1) wsj_0006.tml	Show correct functioning for file upload	Manually upload TimeML file using GUI form	Valid TimeML File	Correct Result Displayed	TimeML Graph displayed
(2) wsj_0006.tml (text)	Show correct functioning for pasted text	Manually paste TimeML annotated text using GUI textbox	Valid TimeML annotated text	Correct Result Displayed	TimeML Graph displayed
(3) sample_incorrect.tml	Detect incorrect content of file	Manually upload TimeML file using GUI form	Invalid TimeML File	Illegal Argument Exception Thrown	Illegal Argument Exception Thrown
(4) sample_incorrect.tml (text)	Detect incorrect TimeML format for pasted text	Manually paste TimeML annotated text using GUI textbox	Invalidly annotated TimeML text	Illegal Argument Exception Thrown	Illegal Argument Exception Thrown

CURRENT SYSTEM

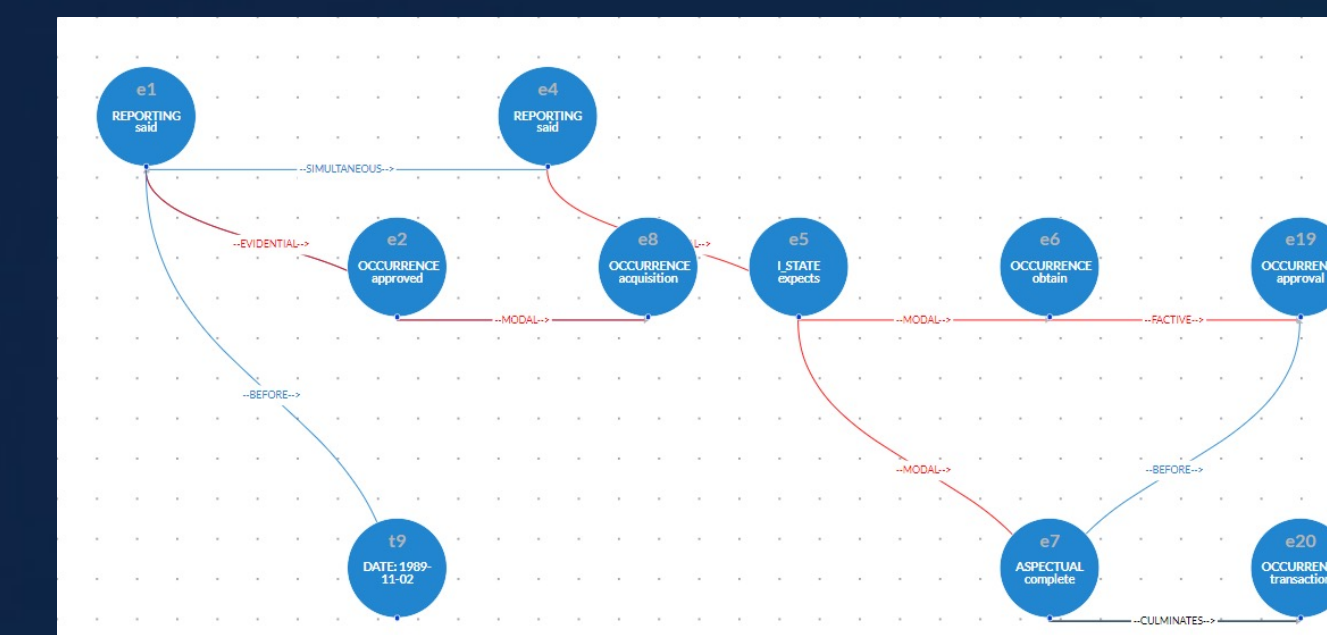
TLEX: Timeline Extraction

Qualitative temporal graphs that are derived from annotations on text—e.g., TimeML annotations—explicitly reveal only partial orderings of events and times. For many purposes, however, a total ordering (i.e., a timeline) is more useful. TLEX adapts prior work on solving point algebra problems to the task of extracting multiple timelines from TimeML annotated texts and demonstrates, for the first time, an exact, end-to-end solution.



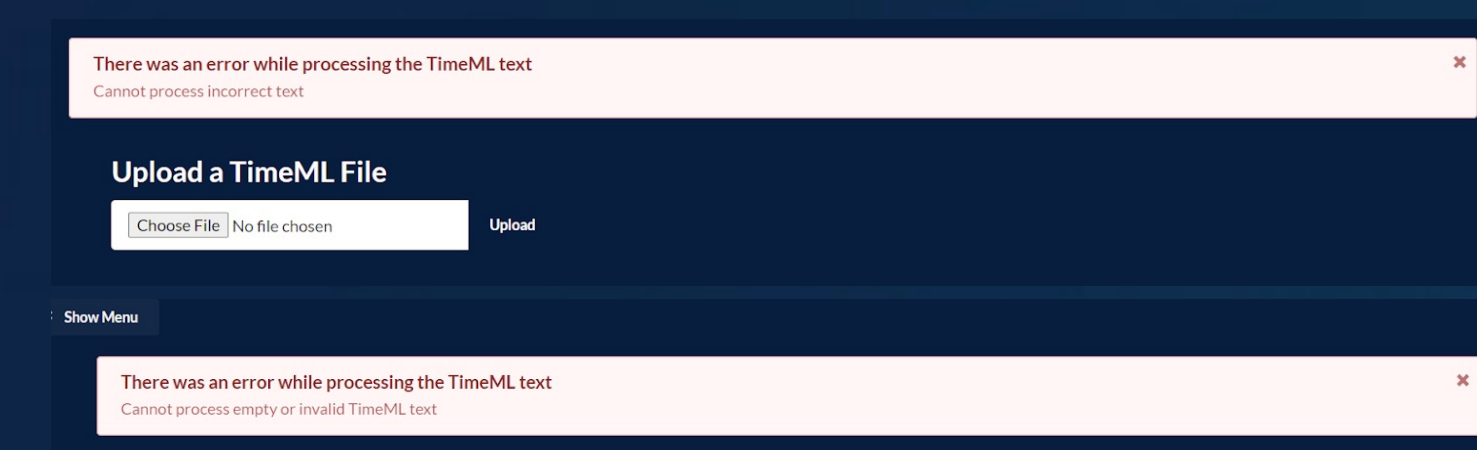
SUCCESSFUL OUTPUT

Test cases (1) and (2) both successfully display the TimeML Graph to the screen.



UNSUCCESSFUL OUTPUT

Test cases (3) and (4) both display the illegal argument exception to the screen.



REFERENCES

Ocal, M. & Finlayson, M.A. *TLEX: A Formally Correct Method for Extracting Exact Timelines from TimeML Temporal Graphs*

REQUIREMENTS

- Gradle v7.1
- JDK 11.0.1
- NodeJS v14.17.0
- npm v6.14.13

IMPLEMENTATION

The **TLEX** Backend was implemented using the Java based Spring Boot framework in the IntelliJ Integrated Development Environment. The **TLEX** Front-end was developed using ReactJS in the Visual Studio Code Integrated Development Environment. **TLEX: Timeline Extraction** uses the jTLEX library constructed in Java using the Eclipse Integrated Development Environment and tested using the JUnit testing framework. To effectively support team collaboration, we managed versions of the web application and the **jTLEX** library with subversion VCS.



SUMMARY

jTLEX 3.0 handles graphic display of the elements obtained using timeline extraction algorithm (TLEX). The main timeline is displayed in form of a directed graph, where each node is identified by unique ID. Additional information is displayed by clicking each node. The list of all the partitions is displayed, with the option of viewing each consistent partition in the form of a timeline



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