TraVIS: Supplemental Material

I. REQUIREMENTS TABLE

This section contains the requirements table, consisting of all the 49 requisites used in TraVIS, divided into four categories: 7 for the Data category (DAT), 16 for Analysis (ANL), 14 for Visualization (VIS), and 12 for Interaction (INT).

TABLE I: The full list of system requirements linked to their assigned requirement ID.

Requirement ID	Description
RDAT1	The visualization system designer should be able to save snapshots of their visualization system at any point.
RDAT2	The framework should provide statistics about the progress of the visualization system.
RDAT3	The system should be able to capture low-level user logs.
RDAT4	The system should be able to store those logs as a user trace.
RDAT5	The framework should store information about visualized information such as number of violations or execution times.
RDAT6	The framework should provide aggregated information about the task or tasks the traces cover.
RDAT7	The framework should provide information about each task separately.
RANL8	The visualization system designer should be able to generate a statechart by providing a system URL.
RANL9	The visualization system designer should be able to filter all the interactions he is interested in.
RANL10	The visualization system designer should be able to cluster all the interactions he is interested in.
RANL11	The visualization system designer should be able to select a snapshot and analyze it.
RANL12	The visualization system designer should be able to compare the current state of the system with the older ones.
RANL13	The framework should be able to store detailed info of a user trace (e.g., times an interaction has been performed, execution time, latency thresholds violations).
RANL14	The system should update the displayed information about the selected subset after a user trace has been added or removed by the user.
RANL15	The framework should compute the degree of correctness in the execution of each task.
RANL16	The framework should compute and visualize the standard deviation in the execution time of the tasks for the selected traces.
RANL17	The visualization system designer should be able to identify a description of paths that will be considered ideal.
RANL18	The designer should execute the ideal path on the actual system and retrieve the ideal user traces for the statechart visualization.
RANL19	The visualization system designer should be able to filter the traces that differ the most from the ideal path.
RANL20	The framework should check if any user traces relate to the ideal paths based on a degree of overlap and by matching their sequence of actions.
RANL21	The framework should provide suggestions on new ideal paths based on user behavior (e.g., the most common way to achieve a task amongst user traces).
RANL22	The framework should be able to replay a specific user trace.
RANL23	The visualization system designer should be able to replay portions of the trace he's interested in by inserting a starting timestamp and an ending timestamp.
RVIS24	The generated statechart should provide an overview of all possible interactions.
RVIS25	The visualization system designer should be able to visualize a previously generated statechart.
RVIS26	The system should provide a clear breakdown of interactive elements and additional information about each one of them such as path characteristics.
RVIS27	The visualization system designer should be capable to visualize a history of the snapshot characterized by different statistics.
RVIS28	The visualization system designer should be able to see detailed information about the selected user trace (e.g., times an interaction has been performed, execution time, latency thresholds violations).
RVIS29	The framework should be able to display anomalies presented by the visualization system.
RVIS30	The visualization system designer should be able to visualize the subpart of the trace he's interested in.

RVIS31	The visualization system designer should be able to see visualized information about the selected subset of user traces such as their aggregated behavior.
RVIS32	The filtered results should be presented on the statechart, distinguishing them from the rest of the interaction space (e.g., by highlighting them).
RVIS33	The framework should visualize the degree of correctness in the execution of each task.
RVIS34	The visualization system designer should be able to see how different users accomplished a certain task performed on the visualization system.
RVIS35	The visualization designer should be capable of representing an overview of the task coverage on the visualization of the interaction space.
RVIS36	The framework should display the coordination between the replay of the user traces and the interaction space.
RVIS37	The framework should visualize the resulted user traces on the interaction space by, e.g., highlighting them.
RINT38	The statechart should be interactable: it can be zoomed, panned, or dragged.
RINT39	The visualization system designer should be able to select a single user trace captured by the framework.
RINT40	The visualization system designer should be able to find a trace in which he could be potentially interested (e.g., a trace that has many violations in latency thresholds).
RINT41	The visualization system designer should be able to select multiple user traces at the same time.
RINT42	The visualization system designer should be able to select and see information about a specific trace of the subset.
RINT43	The visualization system designer should be able to add or remove user traces from the selected subset.
RINT44	The visualization system designer should be able to find a subset of traces in which he could be potentially interested (e.g., a subset that has many violations in latency thresholds).
RINT45	The visualization system designer should be able to filter user traces based on users' details (age, gender, study title).
RINT46	The visualization system designer should be able to filter user traces based on traces' characteristics (e.g., # times an interaction has been performed, duration, latency thresholds violations).
RINT47	The visualization system designer should be able to filter user traces based on more than one criterion at the same time.
RINT48	The visualization system designer should be able to see all the user traces specific to a single task and should be able to split them based on a specific task.
RINT49	The visualization system designer should be able to see all the user traces specific to a single task.

II. TRAVIS' 11 TESTED VA SOLUTIONS

This section contains images of the 11 VA Solutions tested in TraVIS. The visualization system is visible in each image on the left, and the interaction space on the right.

A. *Summit* [1]

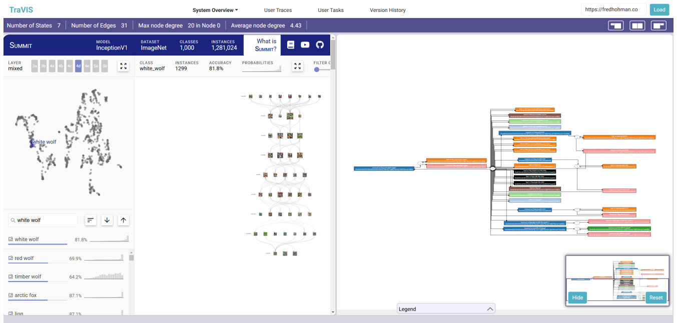


Fig. 1: TraVIS supporting Summit [1].

B. *DataVis* [2]

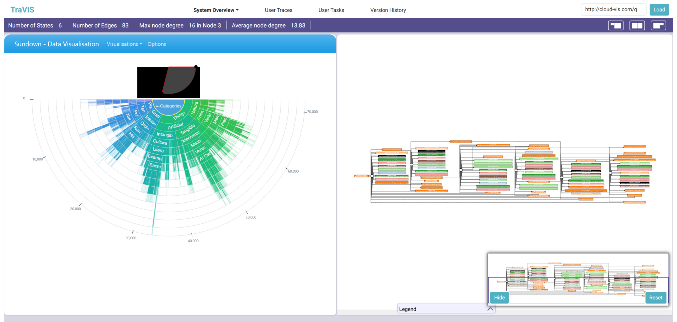

TraVIS
System Overview
User Traces
User Tasks
Version History
http://cloud-vis.com/q
Load
Number of States 6 | Number of Edges 83 | Max node degree 16 in Node 3 | Average node degree 13.83
Sundown - Data Visualisation
Visualisations
Options
Legend
Hide
Reset

Fig. 2: TraVIS supporting DataVis [2].

C. *Falcon* [3]

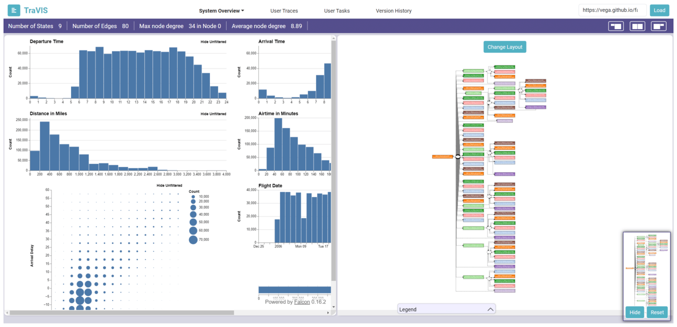


Fig. 3: TraVIS supporting Falcon [3].

D. *Crumbs* [4]

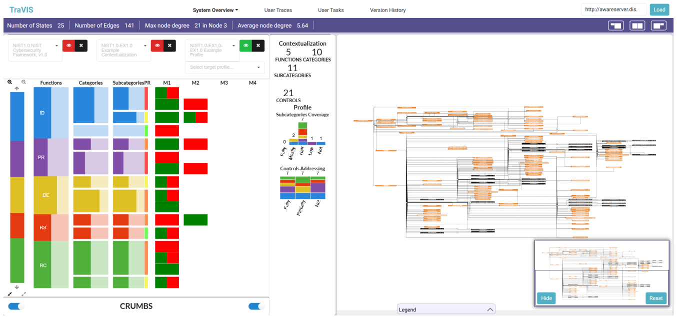


Fig. 4: TraVIS supporting Crumbs [4].

E. *NEMESIS* [5]

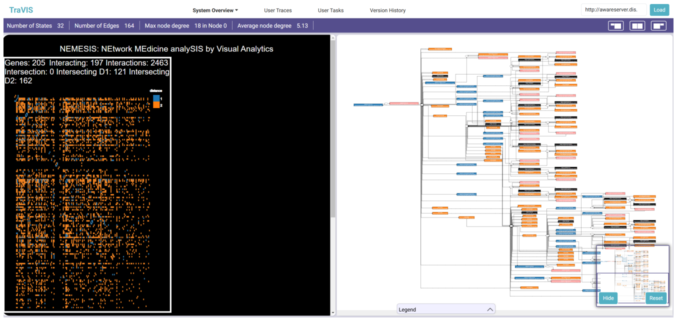

TraVIS
System Overview
User Traces
User Tasks
Version History
http://awareserver.dis.
Load
Number of States 32 | Number of Edges 164 | Max node degree 18 in Node 0 | Average node degree 5.13
NEMESIS: NEtwork MEdicine analySIS by Visual Analytics
Genes: 205 Interacting: 197 Interactions: 2463 Intersection: 0 Intersecting D1: 121 Intersecting D2: 162
Legend
Hide
Reset

Fig. 5: TraVIS supporting NEMESIS [5].

F. *CrossWidget* [6]

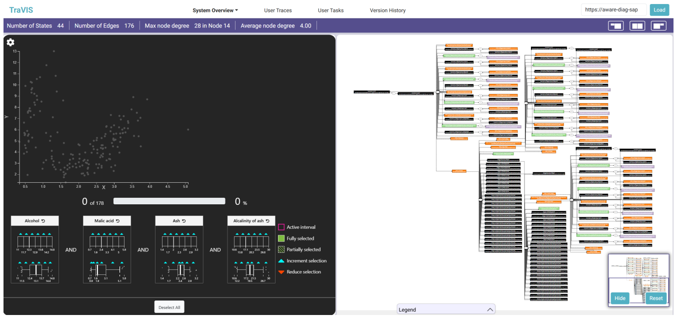
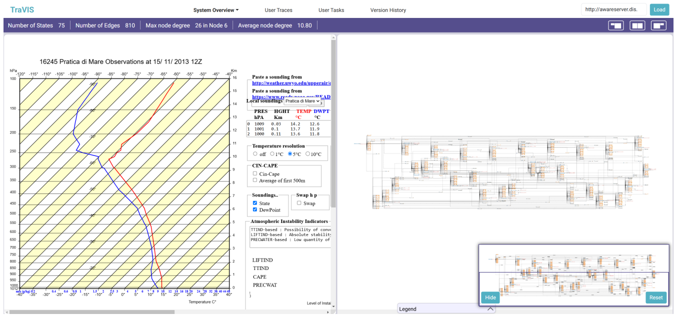


Fig. 6: TraVIS supporting CrossWidget [6].

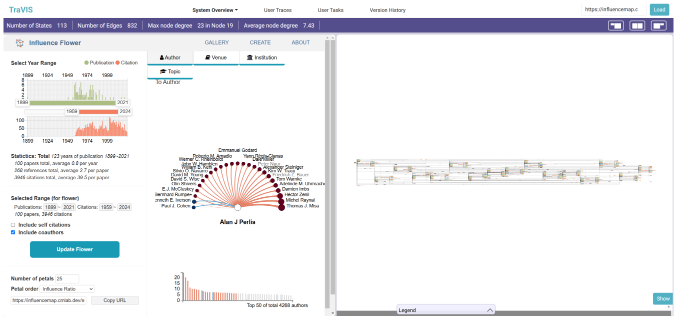
G. *IVAN* [7]



Number of States 75 | Number of Edges 810 | Max node degree 26 in Node 6 | Average node degree 10.80

Fig. 7: TraVIS supporting IVAN [7].

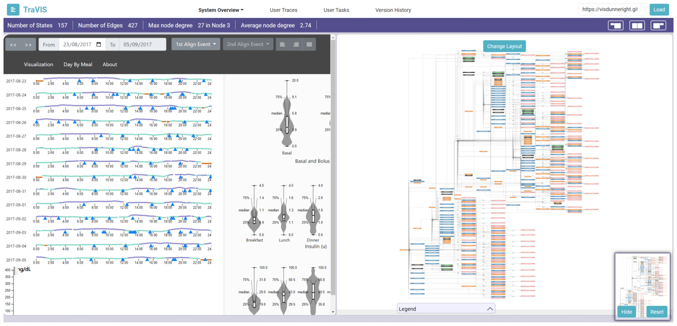
H. *InfluenceMap* [8]



Number of States 113 | Number of Edges 832 | Max node degree 23 in Node 19 | Average node degree 7.43

Fig. 8: TraVIS supporting InfluenceMap [8].

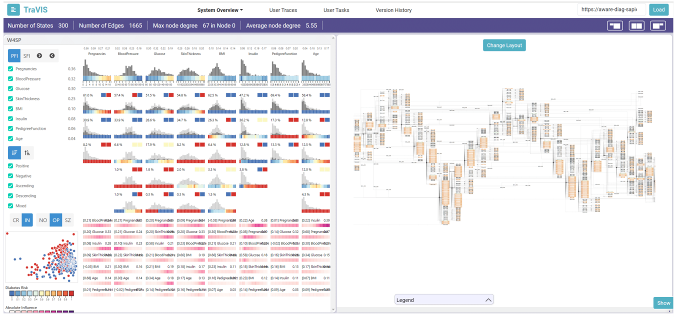
I. *IDMVis* [9]



Number of States 157 | Number of Edges 427 | Max node degree 27 in Node 3 | Average node degree 2.74

Fig. 9: TraVIS supporting IDMVis [9].

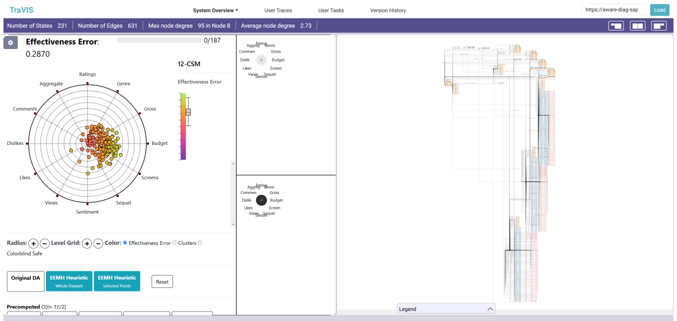
J. *W4sp* [10]



Number of States 300 | Number of Edges 1665 | Max node degree 67 in Node 0 | Average node degree 5.55

Fig. 10: TraVIS supporting W4sp [10].

K. *RadViz* [11]



Number of States 231 | Number of Edges 631 | Max node degree 95 in Node 8 | Average node degree 2.73

Fig. 11: TraVIS supporting RadViz [11].

References

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