

Resource Summary Report

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miniTUBA

RRID:SCR_003447

Type: Tool

Proper Citation

miniTUBA (RRID:SCR_003447)

Resource Information

URL: <http://www.minituba.org>

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Description: miniTUBA is a web-based modeling system that allows clinical and biomedical researchers to perform complex medical/clinical inference and prediction using dynamic Bayesian network analysis with temporal datasets. The software allows users to choose different analysis parameters (e.g. Markov lags and prior topology), and continuously update their data and refine their results. miniTUBA can make temporal predictions to suggest interventions based on an automated learning process pipeline using all data provided. Preliminary tests using synthetic data and laboratory research data indicate that miniTUBA accurately identifies regulatory network structures from temporal data. miniTUBA represents in a network view possible influences that occur between time varying variables in your dataset. For these networks of influence, miniTUBA predicts time courses of disease progression or response to therapies. miniTUBA offers a probabilistic framework that is suitable for medical inference in datasets that are noisy. It conducts simulations and learning processes for predictive outcomes. The DBN analysis conducted by miniTUBA describes from variables that you specify how multiple measures at different time points in various variables influence each other. The DBN analysis then finds the probability of the model that best fits the data. A DBN analysis runs every combination of all the data; it examines a large space of possible relationships between variables, including linear, non-linear, and multi-state relationships; and it creates chains of causation, suggesting a sequence of events required to produce a particular outcome. Such chains of causation networks - are difficult to extract using other machine learning techniques. DBN then scores the resulting networks and ranks them in terms of how much structured information they contain compared to all possible models of the data. Models that fit well have higher scores. Output of a miniTUBA analysis provides the ten top-scoring networks of interacting influences that may be predictive of both disease progression and the impact of clinical interventions and probability tables for interpreting results. The DBN analysis that miniTUBA provides is especially good for biomedical experiments or clinical studies in which you collect data different time intervals. Applications of miniTUBA to biomedical problems include analyses of biomarkers and

clinical datasets and other cases described on the miniTUBA website. To run a DBN with miniTUBA, you can set a number of parameters and constrain results by modifying structural priors (i.e. forcing or forbidding certain connections so that direction of influence reflects actual biological relationships). You can specify how to group variables into bins for analysis (called discretizing) and set the DBN execution time. You can also set and re-set the time lag to use in the analysis between the start of an event and the observation of its effect, and you can select to analyze only particular subsets of variables.

Abbreviations: miniTUBA

Synonyms: miniTUBA - Medical Inference by Network Integration of Temporal Data using Bayesian Analysis tool, Medical Inference by Network Integration of Temporal Data using Bayesian Analysis tool, Medical Inference by Network Integration of Temporal Data using Bayesian Analysis tool (miniTUBA), The Medical Inference by Network Integration of Temporal Data using Bayesian Analysis tool

Resource Type: storage service resource, analysis service resource, service resource, production service resource

Defining Citation: [PMID:17644819](#)

Keywords: analysis, analyze, bayesian, causation, clinical, linear, medical, structure, temporal, network analysis, network, molecule, information refining, gene expression regulation, bioinformatics, statistical package, interaction network, prediction, pathway, inference, biomedical, intervention

Funding: Society of University Surgeons Foundation ;
NIDA U54DA021519;
NIAID 1R21AI057875-01;
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Availability: Free, Freely available

Resource Name: miniTUBA

Resource ID: SCR_003447

Alternate IDs: nif-0000-33272

Record Creation Time: 20220129T080219+0000

Record Last Update: 20260728T043146+0000

Ratings and Alerts

No rating or validation information has been found for miniTUBA.

No alerts have been found for miniTUBA.

Data and Source Information

Source: [SciCrunch Registry](#)

Usage and Citation Metrics

We have not found any literature mentions for this resource.