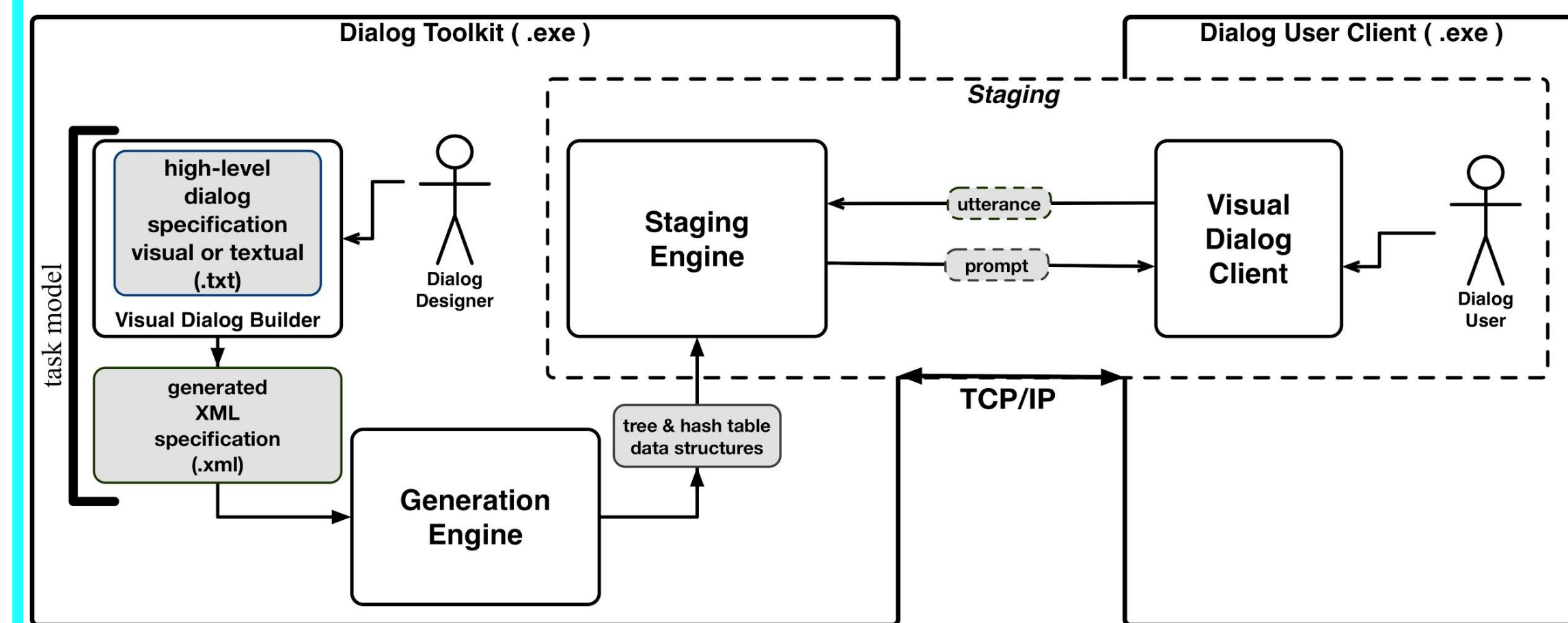# Modeling and Operationalizing Flexible Human-Computer Dialogs

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Implementation

System Diagram

- We use concepts from programming languages, such as curry and partial function application, to achieve flexible dialog evaluation and out-of-turn dialog interaction
- Implementation permits
  - non-programmers to prototype and design dialogs
  - running a server to evaluate (stage) a dialog with clients
  - users to participate in the dialog via messaging client
- Dialog engine implementation is C++ with QT for cross platform applications
- Implementation is packaged as a software toolkit for rapidly prototyping and evaluated dialogs
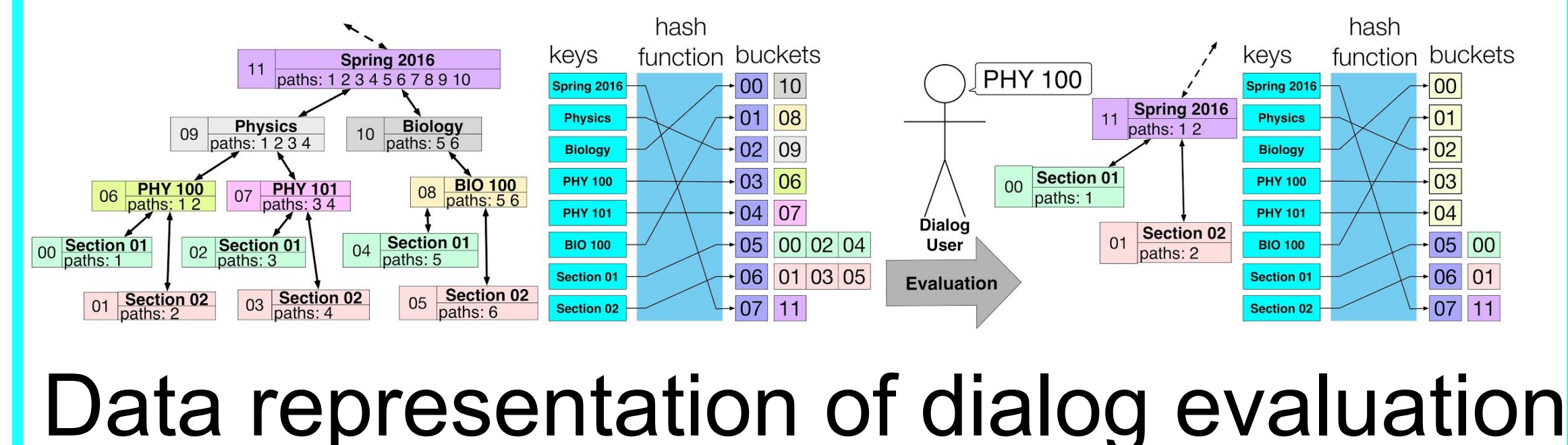
Data representation of dialog evaluation

## Human-Computer Dialog for Course Scheduling
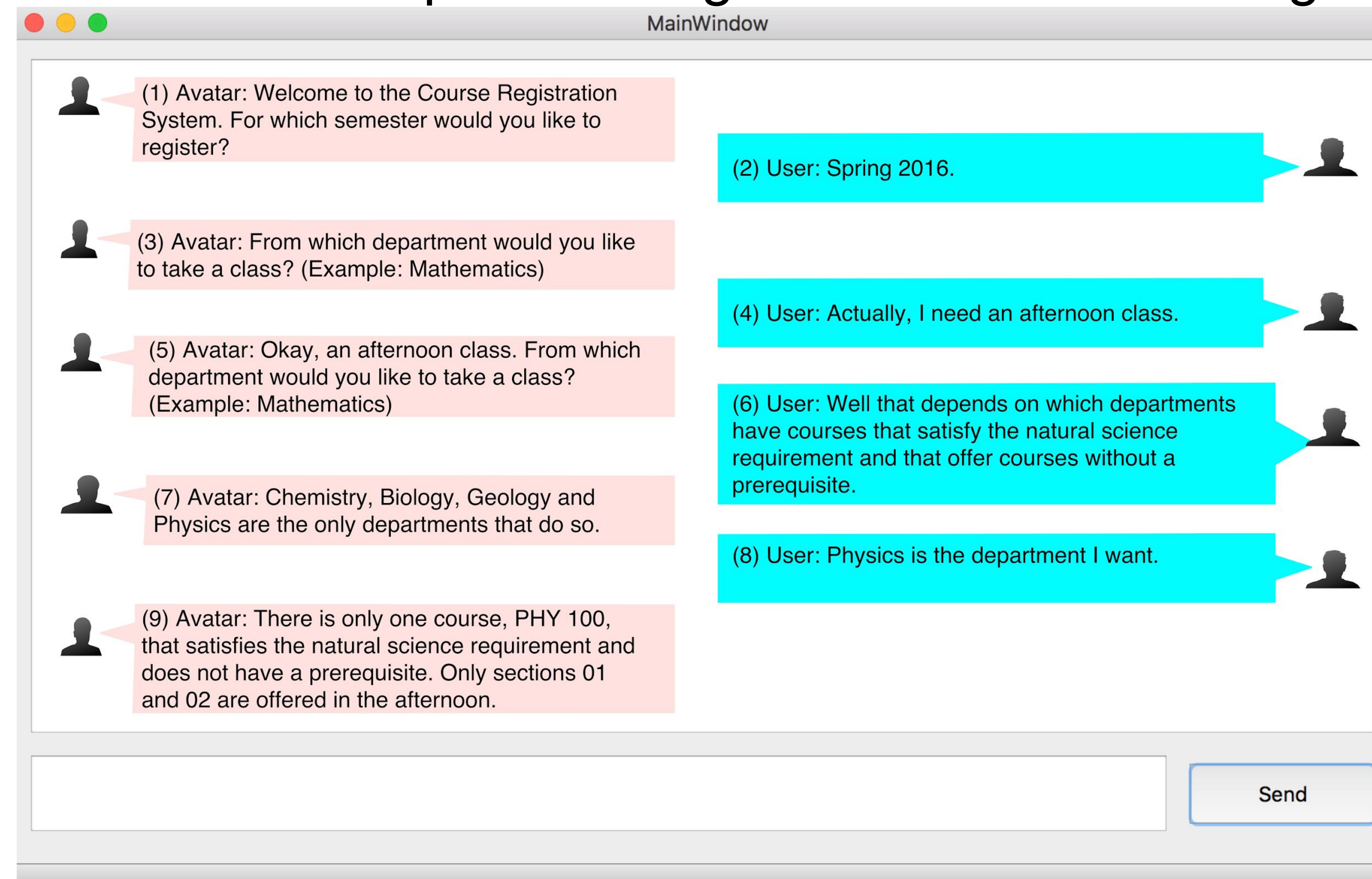
Abstract

We demonstrate a tool for rapidly prototyping dialog-based systems for interactive use. The tool enables a dialog designer to evaluate a variety of dialogs without having to program each individual dialog, and provides a proof-of-concept for our approach to mixed-initiative dialog modeling and implementation. Applications of our tool can be applied to human-computer dialogs common in automated teller machines (ATMs), kiosks, personal assistants, and online forms including course scheduling.

Publications

Perugini, S. & Buck, J.W. (2016). title. In *Proceedings of the Eighth ACM SIGCHI Symposium on Engineering Interactive Computing Systems*, New York, NY: ACM Press. (Conditionally Accepted; pending changes.)

Buck, J.W. & Perugini, S. (2016). A tool for staging mixed-initiative dialogs. In *Proceedings of the Twenty-seventh Annual Modern Artificial Intelligence and Cognitive Science Conference*. (Accepted; to appear.)

Purpose
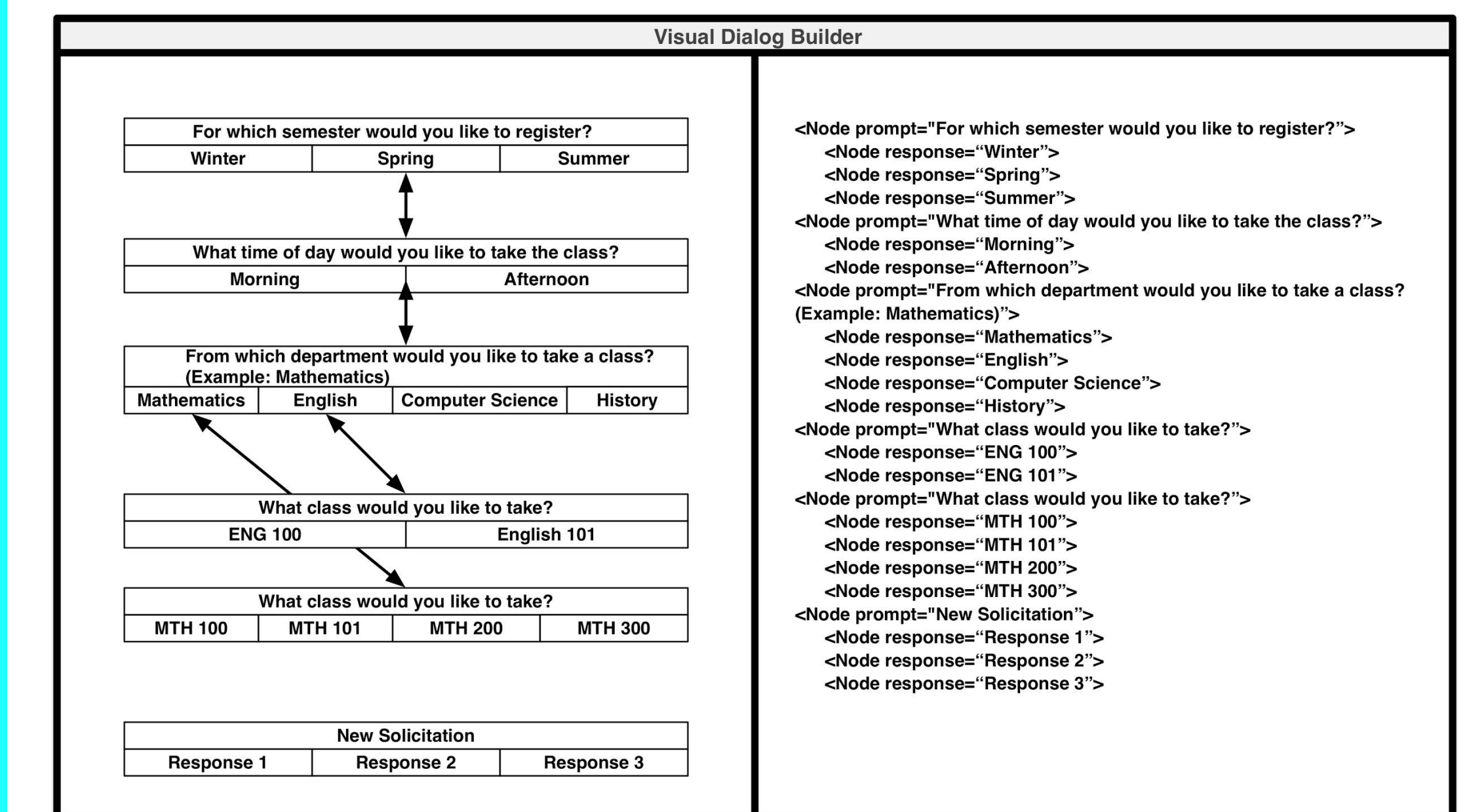
Dialog Designer

- Allow designers to create flexible dialogs where clients are equal participants with the computer and can steer the direction of the dialog
- Designers, without programming, can specify human-computer mixed-initiative dialogs using a visual or textual application
- Using arrow connections and evaluation mnemonics, designers can change the permitted order(s) of dialog evaluation without moving dialog content, creating multiple dialogs from a single specification
- Dialog evaluation model supports choosing from all possible sets of orderings/combinations of client user responses (8196 sets for a 3 question dialog)
- User studies can be simulated without needing to develop an actual dialog system