



A Tool for Staging Mixed-initiative Dialogs

Joshua W. Buck and Saverio Perugini

Department of Computer Science

College of Arts and Sciences

University of Dayton



What is Mixed-initiative dialog?

MainWindow

(1) Avatar: Welcome to the Course Registration System. For which semester would you like to register?

(2) User: Spring 2016.

(3) Avatar: From which department would you like to take a class? (Example: Mathematics)

(4) User: Actually, I need an afternoon class.

(5) Avatar: Okay, an afternoon class. From which department would you like to take a class? (Example: Mathematics)

(6) User: Well that depends on which departments have courses that satisfy the natural science requirement and that offer courses without a prerequisite.

(7) Avatar: Chemistry, Biology, Geology and Physics are the only departments that do so.

(8) User: Physics is the department I want.

(9) Avatar: There is only one course, PHY 100, that satisfies the natural science requirement and does not have a prerequisite. Only sections 01 and 02 are offered in the afternoon.

Send

- The user is an equal participant in the dialog with a computer.
- When permitted in the dialog specification, a user can provide unsolicited responses or even ask the computer questions of her own.[Lines 4 and 6]



Modeling Dialog as a Function

- $\text{Dialog}(\text{Response}_1, \text{Response}_2, \text{Response}_3, \dots, \text{Response}_N)$
- model of a dialog with N solicitations
- We can now curry or partially apply arguments (responses) to this function to model a user providing unsolicited responses.
- Providing *Response*₂ to function *Dialog* returns $\text{Dialog}(\text{Response}_1, \text{Response}_3, \dots, \text{Response}_N)$
- When all responses are provided, the Dialog is complete.

Uncurried	All responses in one stroke
Curried	One response at a time, in order
Partial Function Application	One or more response at a time, in order
Partial Evaluation	Any order, any combination
Single Argument Partial Evaluation	One at a time, in any order



Examples

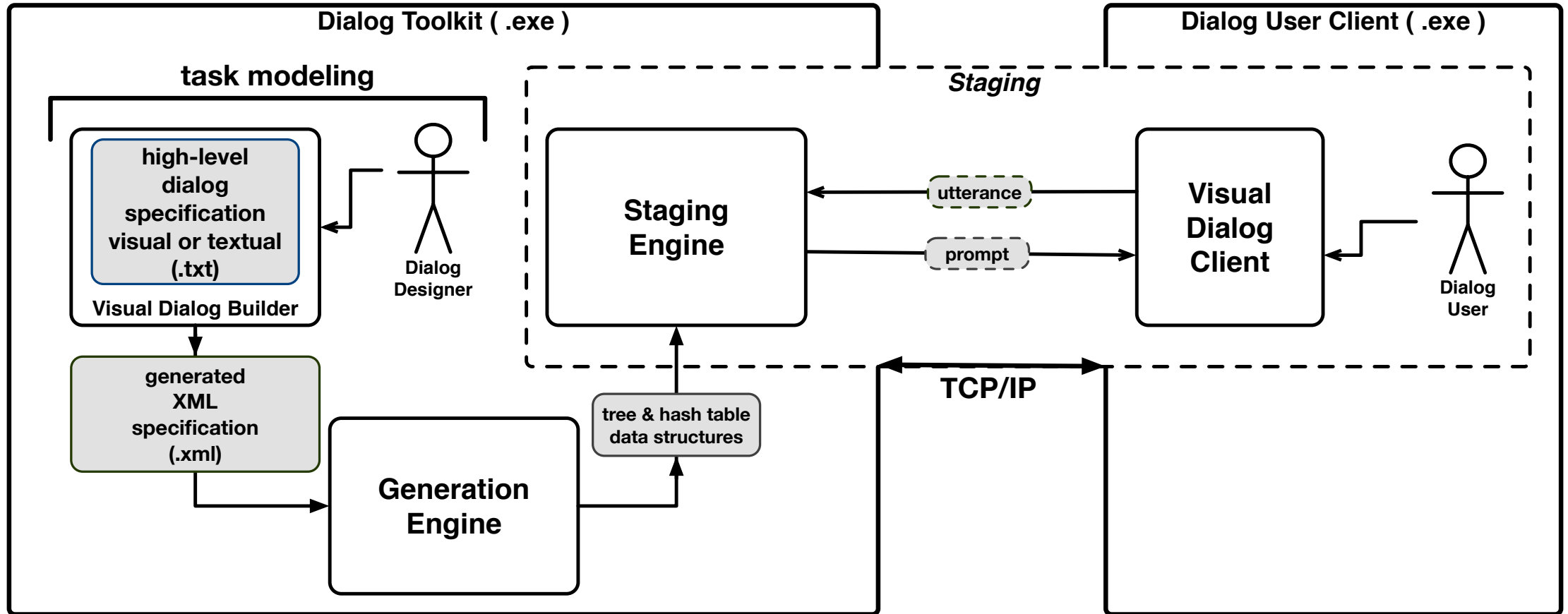
Curried

- CoffeeDialog(Size, Blend, Cream)
=> User provides Size
- Dialog(Blend, Cream)
=> User provides Blend
- Dialog(Cream)
=> User provides Cream
- Dialog Complete.

Simple Partial Evaluation (one case)

- CoffeeDialog(Size, Blend, Cream)
=> User provides Blend
- Dialog(Size, Cream)
=> User provides Cream
- Dialog(Size)
=> User provides Size
- Dialog Complete.

Dialog System Architecture





Demonstration



Final Notes

- We have designed is a toolkit for staging a variety of mixed-initiative dialogs
- Our toolkit will benefit from a study with users to determine if the dialogs it yields have desirable properties.



Questions?

Saverio Perugini

Email: saverio@udayton.edu

Joshua Buck

Email: jbuck1@udayton.edu