A Tool for Staging Mixed-initiative Dialogs

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What is Mixed-initiative dialog?

- 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

- Dialog(\(\text{Response}_1, \text{Response}_2, \text{Response}_3, \ldots, \text{Response}_N\))
  - 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 \(\text{Response}_2\) to function \(\text{Dialog}\) returns
  \(\text{Dialog(\text{Response}_1, \text{Response}_3, \ldots, \text{Response}_N)}\)

- When all responses are provided, the Dialog is complete.

<table>
<thead>
<tr>
<th>Uncurried</th>
<th>All responses in one stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curried</td>
<td>One response at a time, in order</td>
</tr>
<tr>
<td>Partial Function Application</td>
<td>One or more response at a time, in order</td>
</tr>
<tr>
<td>Partial Evaluation</td>
<td>Any order, any combination</td>
</tr>
<tr>
<td>Single Argument Partial Evaluation</td>
<td>One at a time, in any order</td>
</tr>
</tbody>
</table>
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

Dialog Toolkit (.exe)
- Task modeling
- Dialog User Client (.exe)
- Staging
- Visual Dialog Builder
  - High-level dialog specification (visual or textual (.txt))
  - Visual Dialog Designer
  - Generated XML specification (.xml)
- Staging Engine
  - Utterance
  - Prompt
- Generation Engine
  - Tree & hash table data structures
- TCP/IP
- Visual Dialog Client
  - Dialog User
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?

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