

A Framework for Summarizing Game Experiences as Narratives

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Background

- Game players extremely involved in game worlds for extended periods of time
- Replay features would provide players with summaries of important events
- Game experiences provide good sources of stories

Hypothesis:

Game logs can be translated into plan structures, because

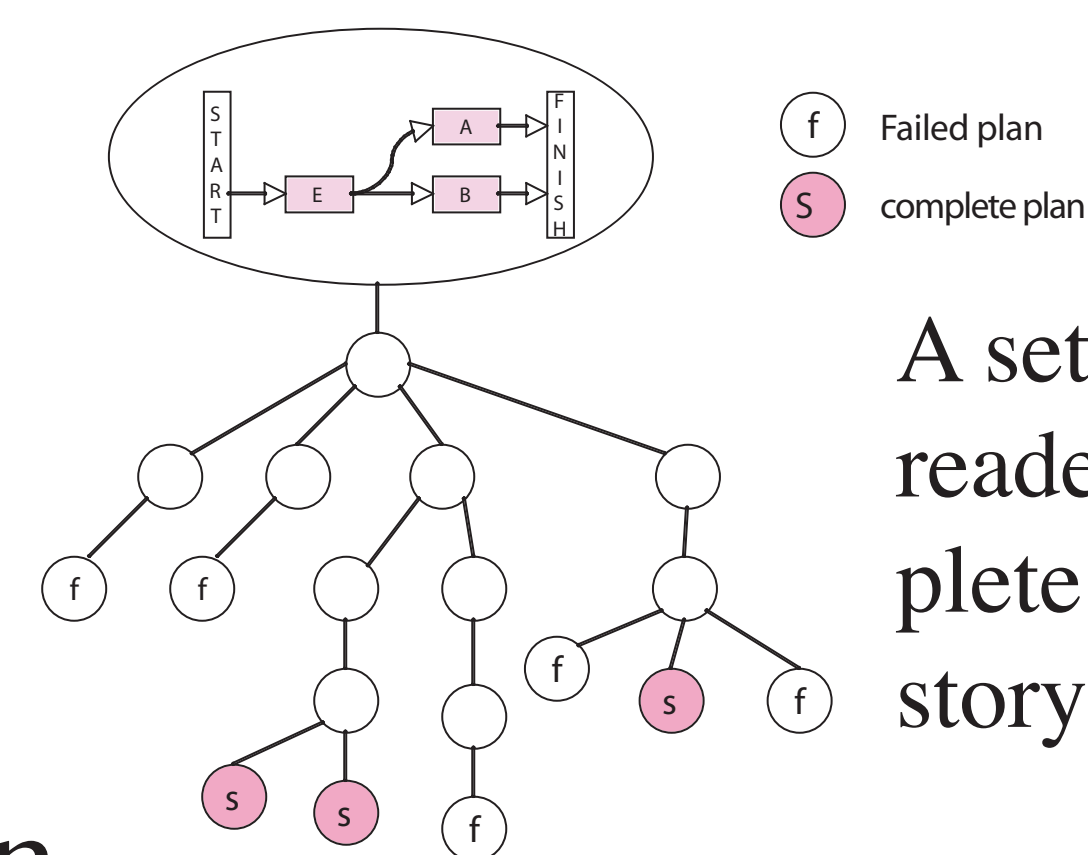
- Game users are given a mission to complete, which corresponds to a goal of a plan
- Game actions performed by users are causally related

Important actions in a plan can be extracted using their causal relationships to the goal

Log Analyzer

Translates a game log into plans

- Parses the log
- Interprets one action into an instantiated plan step using a plan library
- Create a partial plan that contains those plan steps
- Complete the plan by establishing causal links for each step



A set of kernels are coherent if the reader model can construct complete plan solutions for the given story goal from the set

Experimental Evaluation

- 25 subjects from North Carolina State University
- Paper-based survey, with a plan that consists of 14 steps
- Procedure
 - The subjects read a text describing the plan
 - They selected the most important 5 events
 - They ranked the importance of each event
 - They compared their summaries with the system-generated summary

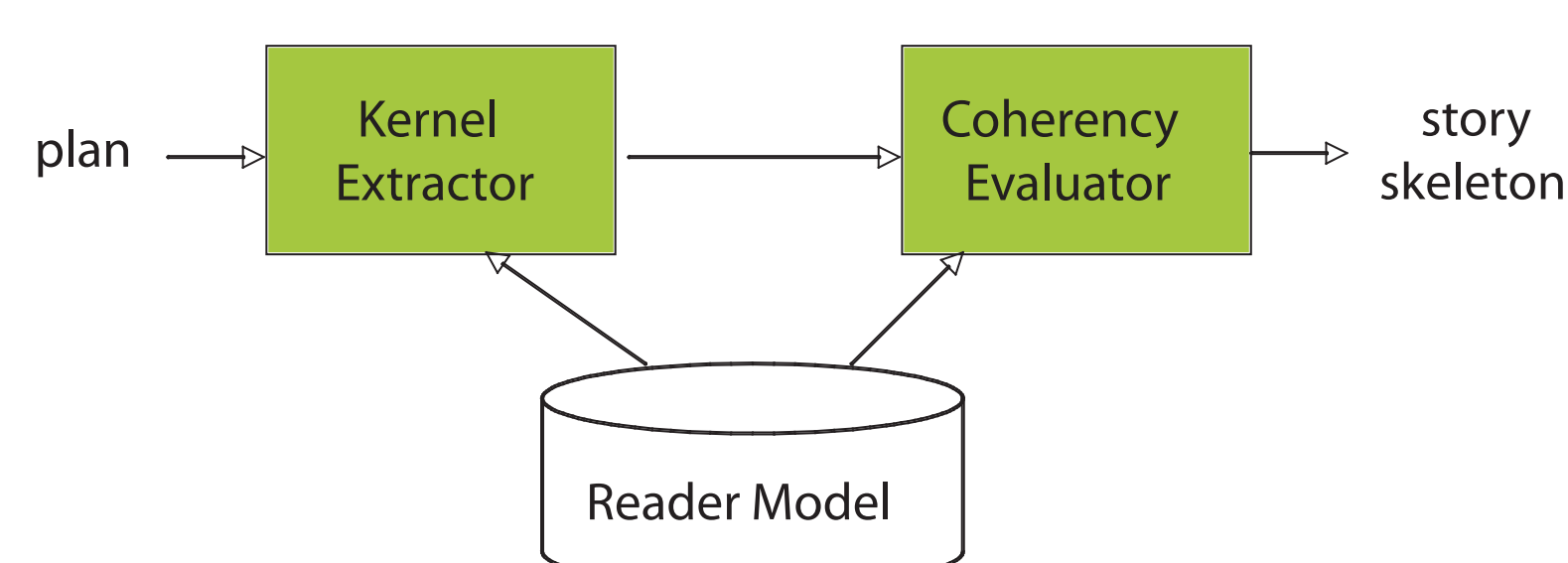
Evaluation of summary

- 32%, System-generated summary is better
- 52%, equally good
- 12%, the subject's summary is better

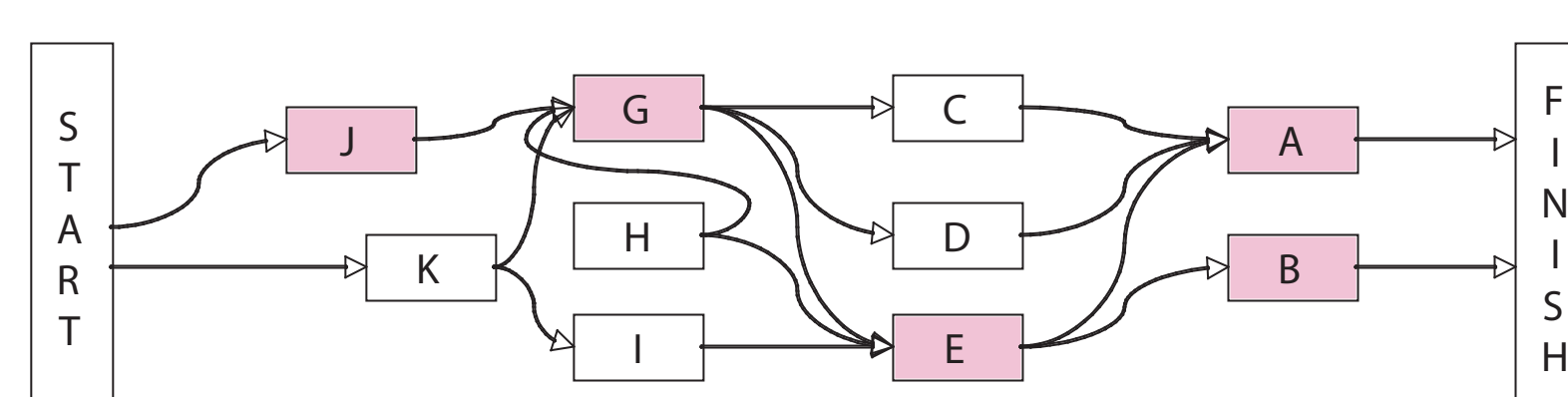
Percent of inclusion and rank for each sentence

Sentence id	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Inclusion (%)	20	96	0	16	0	52	0	8	0	48	64	8	88	100
Rank	7.7	2.1	11.	10.	11.6	7.2	10.4	9.5	10.2	7.1	4.4	8.8	2.8	2.2
Rank stdev	3.7	0.9	2.7	2.9	1.9	3.5	2.4	2.5	2.2	2.9	2.1	3.1	1.2	1.4

Skeleton Builder



The Kernel Extractor chooses important events and the coherency evaluator checks a candidate skeleton to see if the content yields a coherent narrative

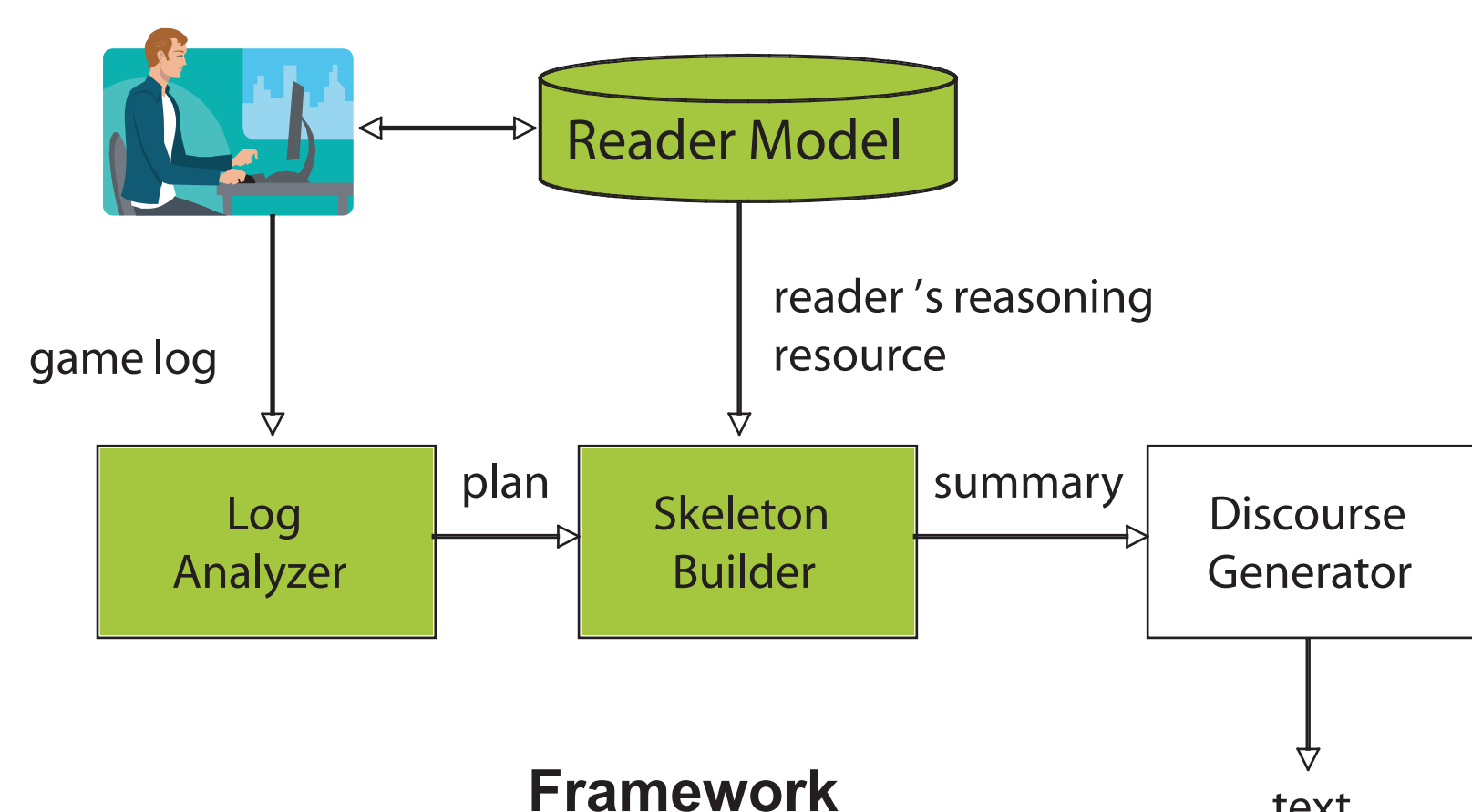


$$w(a) = (k_i In(a) + k_o Out(a) + k_c cc(a))$$

$w(a)$: importance of the action a
 $In(a)$ returns the number of a 's incoming causal links
 $Out(a)$ returns the number of a 's outgoing causal links
 $cc(a)$ returns a value corresponding to the event's type
 $k_i = 1$, $k_o = 5$, $k_c = 2.5$ for this pilot study
 $type = \{opening\ act, \ closing\ act, \ motivated\ act, \ dead-end\ act, \ other\}$

Reader Model

- Reasoning algorithm: a hierarchical partial-order causal link planner
- Resource limit: number of nodes that can be searched in the plan space
- Domain knowledge: plan library



Conclusions and Future Work

The system selected events that constitute a qualitatively strong summary, as evaluated by human subjects

Applications

- Summaries of game logs as well as other types of digital logs (e.g., image, video clip)

Future Work

- Use a real game log
- Extend the system to handle multi-player games

LN Group web page at <http://liquidnarrative.csc.ncsu.edu>

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