Bournemouth University

# Intel-PA Dialogue Engine - a discussion paper

Centre for Digital Entertainment

ncca

# Intel-PA: Intelligent Virtual Personal Assistant

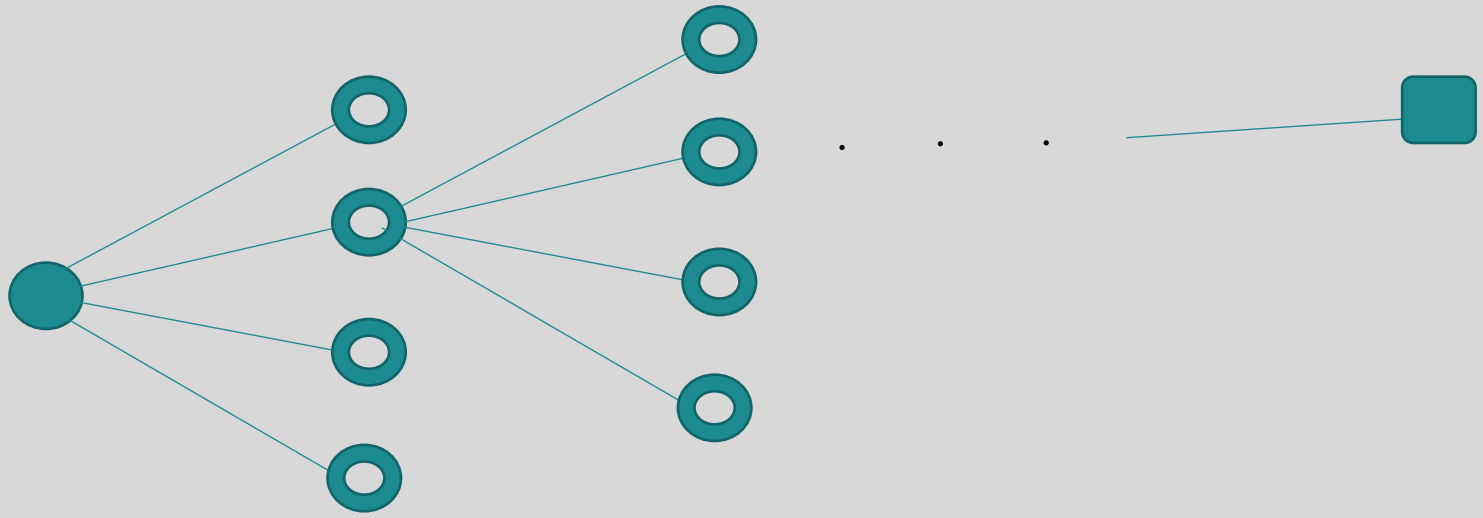
- Intel-PA contains three key elements:
  - Dialogue engine
  - 3D avatar with plausible facial expressions and voices
  - Understanding paralinguistic inputs, e.g. gestures and facial expressions of the human user

# Intel-PA Dialogue Engine Conceptual Design

- Hybrid model:
  - decision making structure - rule based (graph/tree based)
  - Local dialogue - freeform dialogue applying to the nodes of the graph/tree
- Aiming for: application oriented subjects (instead of a completely freeform dialogue model), e.g.
  - The breast clinic referral project as a case study

# Intel-PA Dialogue Engine Conceptual Design

- Hybrid model:



# Intel-PA Dialogue Engine Conceptual Design

- Rationale:
  - It is difficult to obtain subject based data to train the needed conversational AI model.
  - A domain specific knowledge base is normally small and can be dealt with manually by experts, e.g. to score marks or likelihood. This allows a graph/tree structure to be built.
  - Once the category of the question is given, such as “Did any members of your family suffer from breast cancer?”, a freeform dialogue model makes the conversation sound natural and humanlike.
  - We can take advantage of existing conversational models derived using other more commonly developed sources, such as news and social media.

# Research Topics

- Decision graph/tree design in consultation with domain experts
  - Branches
  - Node sequences
  - Key questions, e.g. ”family member(s) suffered from breast cancer”

# Research Topics

- Freeform conversations at the node level:
  - Generating questions centred around the “key question”, e.g. “Did anyone from your family suffer from breast cancer?” or more subtly, “Tell me about your family”.
  - How to follow on from a previous answer (history). It should naturally lead to the next node.
  - Dialogue generation considering the emotions of the patient.
  - Transitional sentences, e.g. “sorry to hear …”
  - Decision on the next node of the tree.
  - Understanding/analysing the answers/sentences from the patient,
    - Extracting the key meaning from a sentence.
    - Extracting sentiments from the answer and the history of the answers.
  - Make use of existing training models.
  - Develop databases for medicine related sentences/terms