Question-Answering LR&E roadmap proposal

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QA: general aspects

- QA is AI-complete
  - Proper decomposition of the whole QA problem is necessary
- QA seen as embedded basic functionality
  - Important to identify the core QA functionality, which is stable and independent from specific QA application scenarios
  - Proper identify relationship to other research areas, e.g., IE, IR, KRR, SW, MT, ...
- Bottom-up system development („divide-and-interact“)
  - Data-oriented user, domain, task adaptive systems
  - Machine Learning & Explanation component
  - Cooperating specialised QA-components/agents

QA research subtasks

1. cross-lingual, open-domain QA, 2006
2. large-scale domain-specific QA, 2008
3. adaptive QA, 2010

Cross-lingual, open-domain QA

- Already in progress: e.g., CLEF
- Additonal needs, e.g.,
  - Real cross-language answer sources (not just English)
  - NL-generation of answers into query language
  - Evaluation standards for complex queries (e.g., definition, template questions)

Large-scale domain-specific QA

- Answers queries about a certain domain
  - fine-grained domain ontology
  - specialized lexica and sub-grammars
- Parts of the domain-related knowledge are automatically acquired by the QA-system
- The system has restricted capabilities of interaction
  - request relevant information for controlling its internal decision process
- In dependence of the type of question and the answer sources (raw text, marked-up web pages, numeric data)
  - the system recognizes and plans appropriate answer selection strategies
  - as well as the answer generation mode: depending on current QA-context, e.g., short answer string, (multi-media) summary, pointers into ontology, etc.)

Adaptive QA

- QA system is able to adapt towards user, domain, data sources.
- The QA-system has restricted dialog capabilities.
- It builds up and treats a structured episodic memory, which it uses as source for self-evaluation, machine learning of novel QA-strategies, and setting up context awareness.
- QA system (in interaction with a domain expert) is used for building up domain knowledge.
- In order to improve/adapt its performance, system is able to create its own questions in order to perform self-initiate QA-cycles.
- QA-system can communicate with other self-adaptive QA-systems in order to built up a society of specialized QA-agents.