AI Research Group Meeting
Monday October 2, 2006
FGH 244

Brainstorming about Constellation Identification

Facilitated by Doug Fisher

At Monday's meeting we will try something: having a discussion on a
topic/task/spec/problem/... that is posted in advance. Here is some background on and a
statement of Monday's topic -- it draws upon my childhood interests in Astronomy and
Mythology, as well as presenting some interesting challenges for AI.

Topic:

Early people looked at the night sky and identified constellations -- groups of stars that fit
some pattern (or were made to fit some pattern).
Constellations often corresponded to some mythological character. Groups of
constellations often referred to several characters of some story.

I am interested in brainstorming on the requirements (perhaps even the design !!) of an
AI system that identifies constellations. I'm not concerned that the system identify the
same constellations that early humans "discovered" but I am interested that at some level
it model the processing of humans -- minimally, that it call upon the same sources of
knowledge and the same processing capabilities.

Here are some specific questions -- there may be
others:

1) To what extent and in what capacity is constellation-identification (CI) a data-driven
activity

a) for example, its hard for be to believe that someone looking at the stars Rigel and
Betelgeuse doesn't see a person! There is almost certainly a knowledge-driven
component in this recognition (e.g., a template), but there is a data-driven aspect
too...e.g., salience ... Rigel and Betelgeuse are two of the brightest stars in the night sky
of the Northern Hemisphere

 Who among us knows something about object recognition from dot patterns?

2) To what extent and in what capacity is CI a knowledge-driven activity

  a) use of templates, as mentioned in 1a? but more ...

  b) once a person is identified in the night sky, what is the person doing? Fighting wild
  beasts? A bull? A dragon?

A bear? Does the person have a hunting dog tagging along?
How is this thematic knowledge, if exploited, represented?

3) In what ways is CI a goal-driven activity? What goals? Navigation? Simple explanation of mystery? How are these goals represented and exploited?

a) Julian Feldman, an AI pioneer, modeled the binary-choice behavior of humans -- humans work REALLY hard to find patterns in even random data, even when they are told its random data !! To what extent is that happening in CI .

4) Whats the relation of CI to AI formalisms such as planning, clustering, object recognition.... the task of CI seems way-out there, but does it have relevance to more conventional AI work? For example, does thinking about CI inform the development of a knowledge-driven approach to clustering?

I ask that everyone think a little bit about any and all aspects of CI as they want and bring those ideas to Monday's meeting -- if each person has even a couple of ideas then we've got an interesting discussion.

*** I ask that you send me a powerpoint slide with bullet items (heck, diagrams, references, etc) as much as you want up to 1PM on Monday, and we'll start by tag-teaming through each person's thoughts ,,, then talk. ***