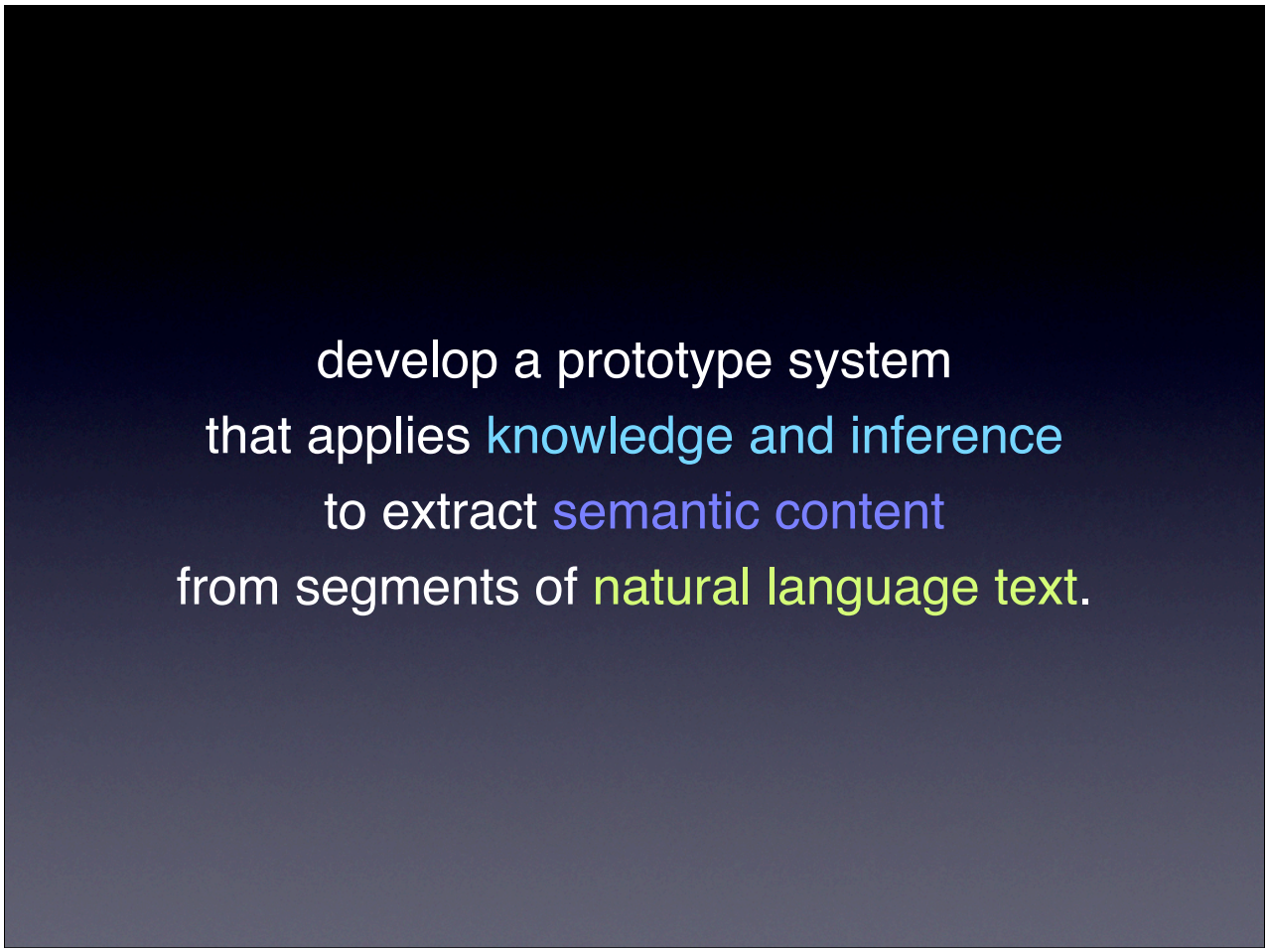
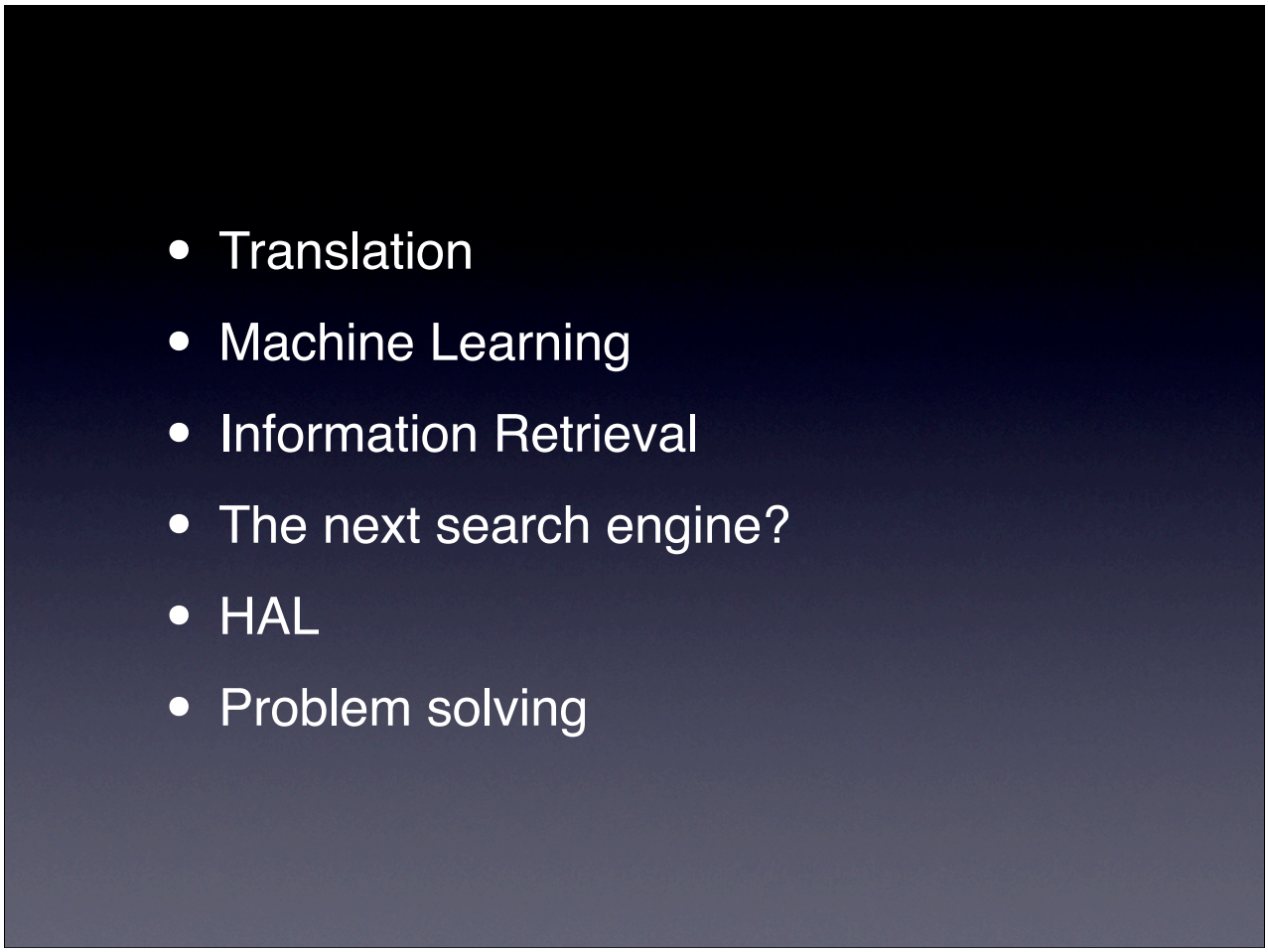
I compute

therefore I am.

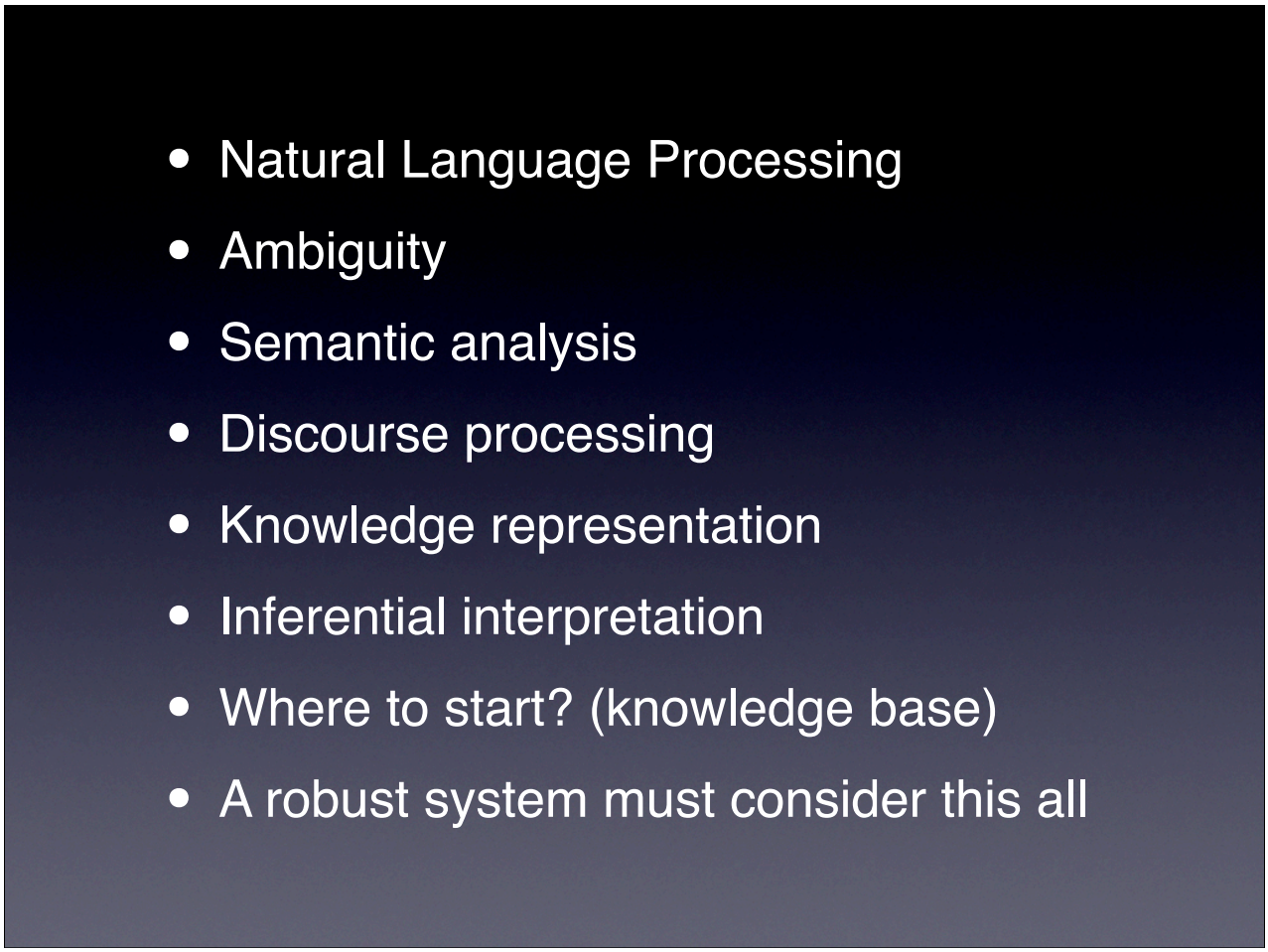


Problem Description

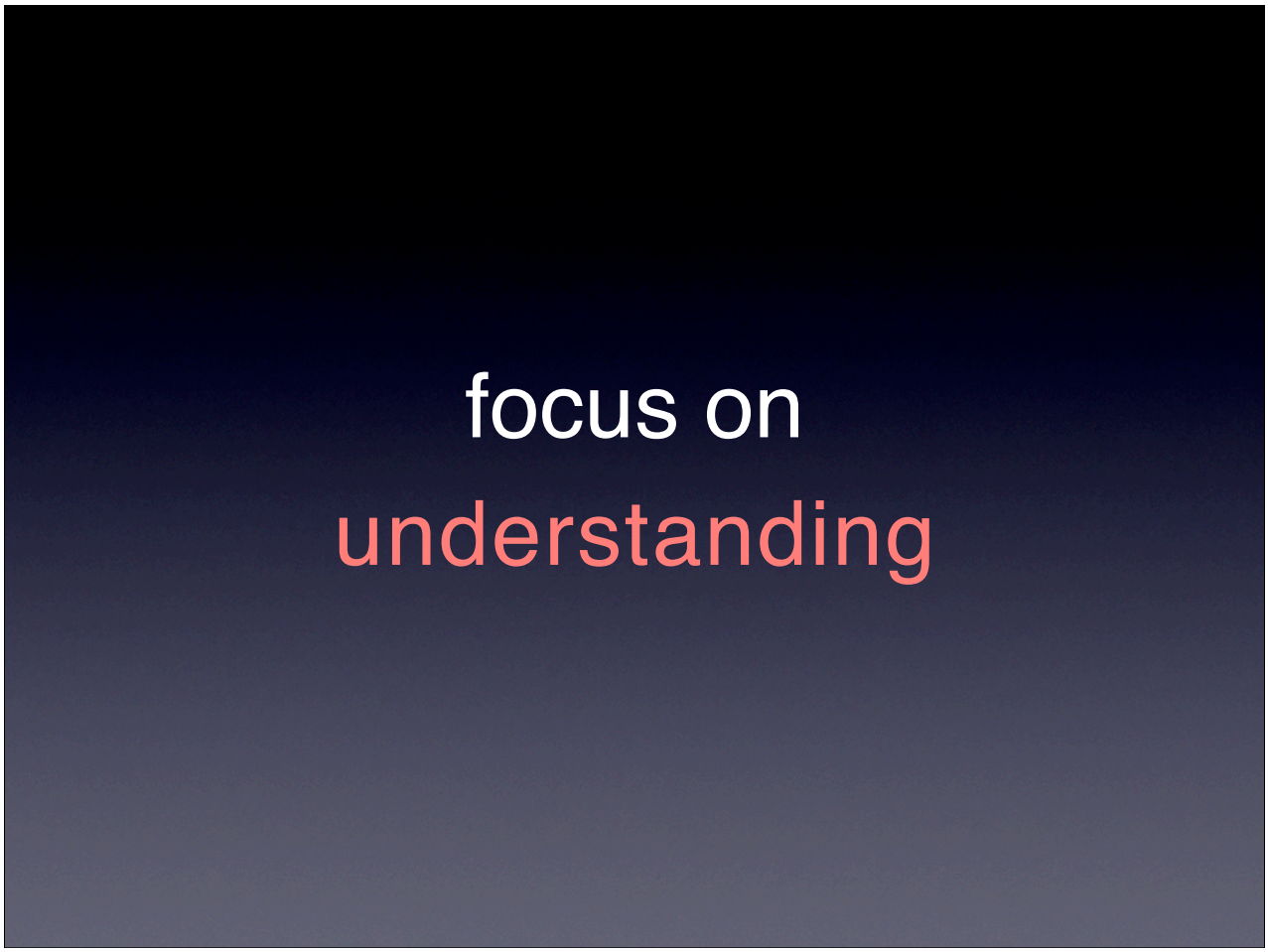
This is a well studied field, I wi



Why is it important?
- Translation
- Machine Learning
- Information Retrieval
- The next search engine?
- HAL, thinking systems
    helpful devices
    human computer interaction
- Problem solving
    Requires imagination



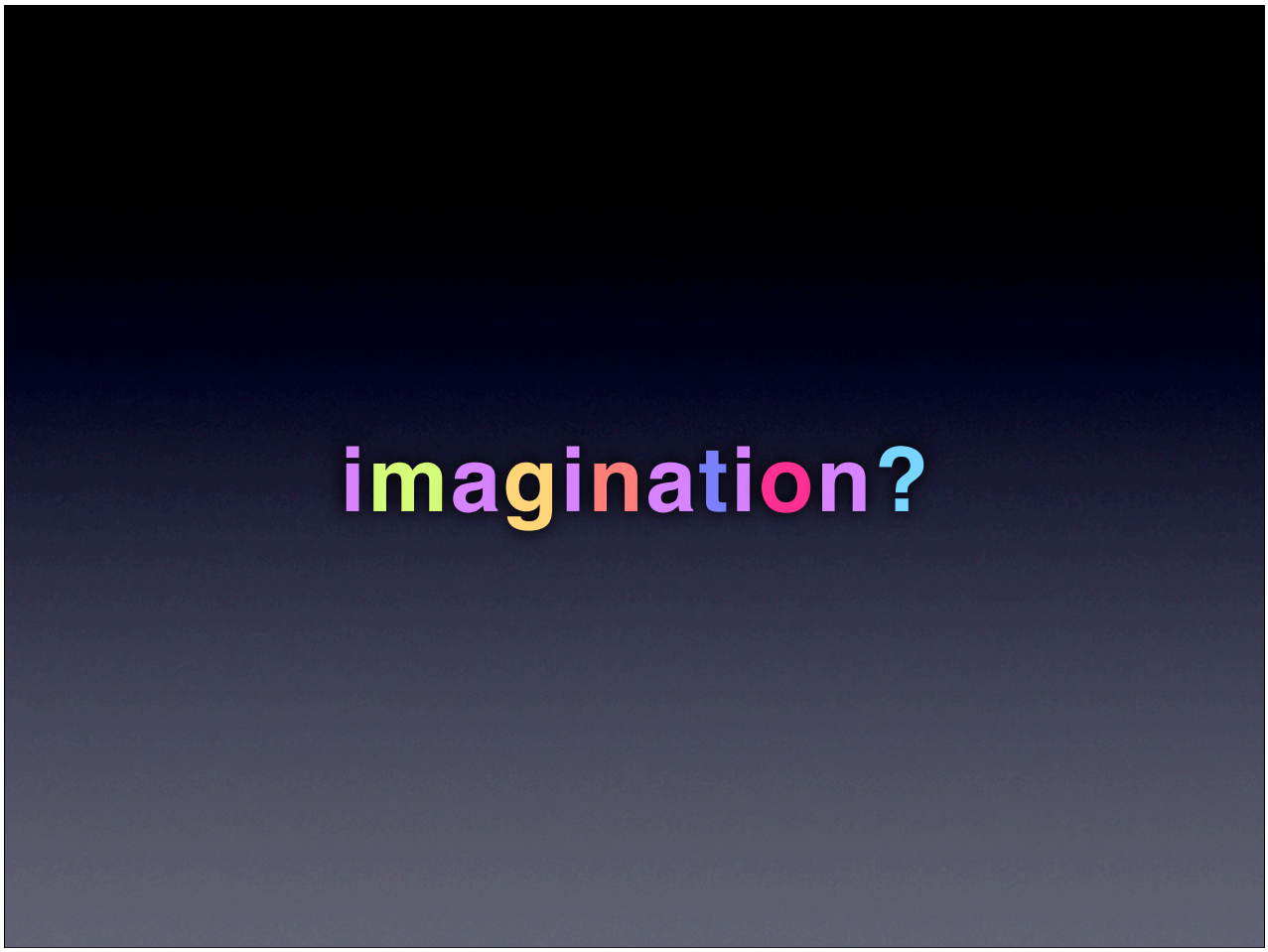
Why is it hard?
- Natural Language Processing
- Ambiguity
  Time flies (Prof. Eggert)
- Semantic analysis
  Removing the language, keep the meaning/A separating of language and meaning
- Discourse processing
  What information is contained in extended sequences of utterances that goes beyond the meaning of the individual utterances themselves?
  (2) how does the context in which an utterance is used affect the meaning of the individual utterances, or parts of them?
- Knowledge representation
  How do I represent the knowledge?
  What language?
- Inferential interpretation
  e.g. “his emphasis on order and health, and by inference cleanliness.”
  Understand an advertisement with an expensive car to be a status symbol
- Machines must start with a great deal of real world knowledge to apply inference.
- A robust system
  Not tied to a certain domain
  Capable of finding new ways to solve the problem (interaction)



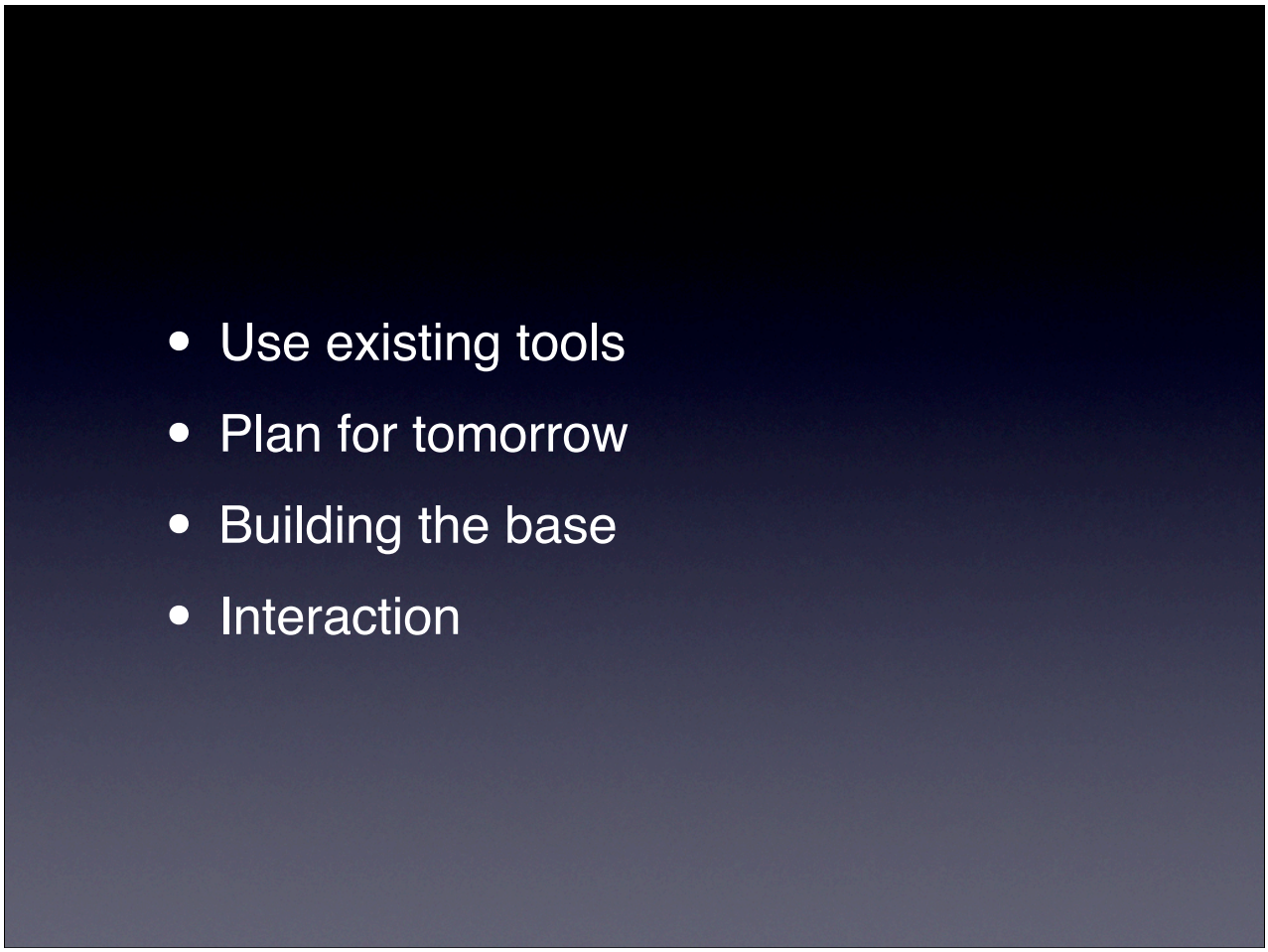
What will the knowledge representation be? ....

Why is it hard? continued (What must a knowledge representation be)
What is a knowledge representation?
- A surrogate
    A substitute for the real thing, used to enable an entity to determine consequences by thinking
    rather than acting.
- A set of ontological commitments
    In what terms should I think about the world
- Theory of intelligent reasoning
    1) the representations fundamental conception of intelligent reasoning
    2) the set of inferences that the representation sanctions
    3) the set of inferences that it recommends
- Medium for pragmatically efficient computation
    The computation environment in which 'thinking' is accomplished
    Or I might say the 'surrogate' thinking is accomplished
- Medium of human expression
    The language in which we say things about the world
What is a knowledge representation; Randall Davis, Howard Shrobe, and Peter Szolovits

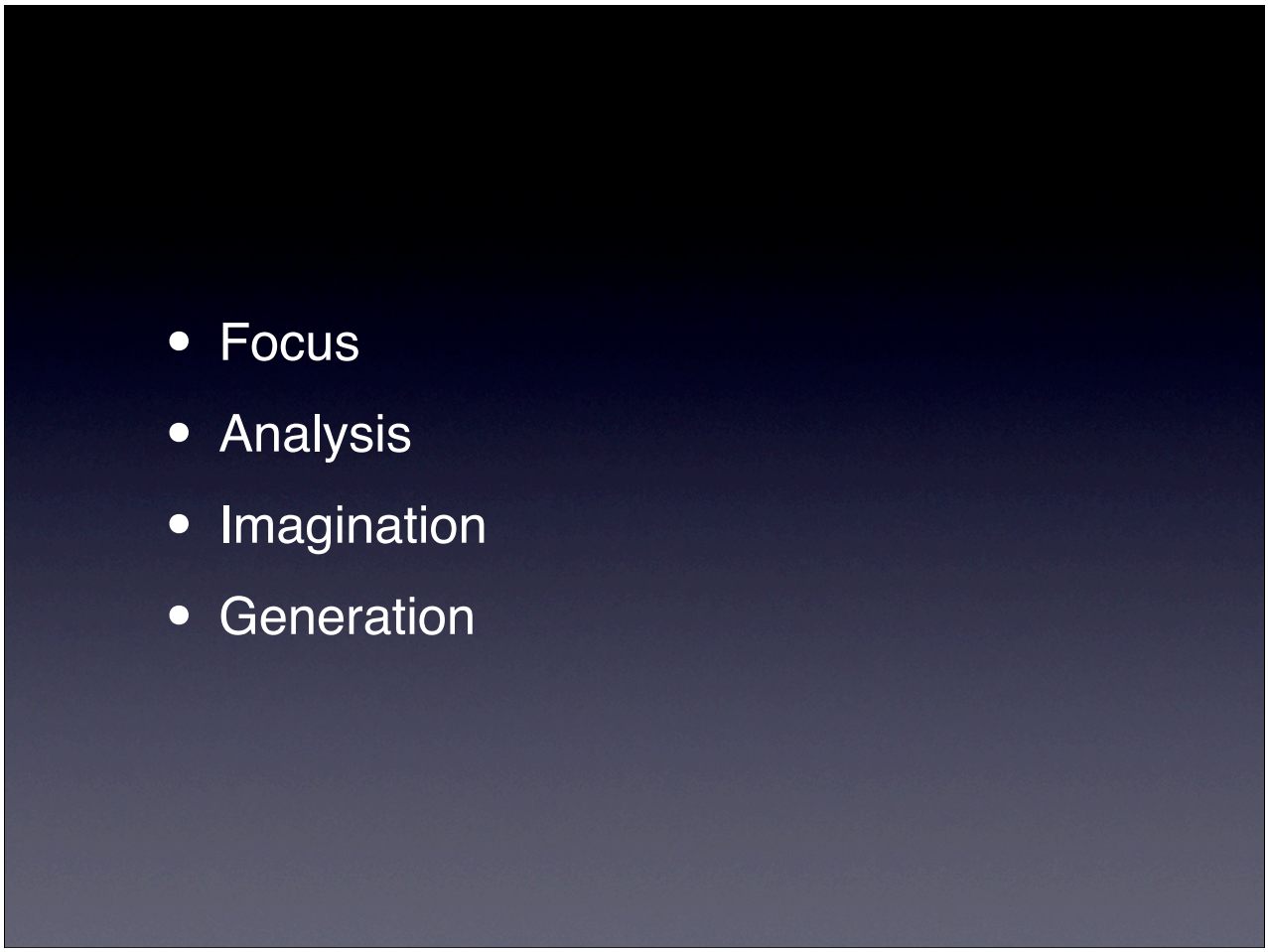
Why is it hard? (continued)... unity:
Each role played by a knowledge representation creates a new set of properties for the knowledge representation
Is there one correct way to to this? An overarching solution?
How are these properties unified?



What's new?
What's missing from the knowledge representation..
Imagination, there is no fundamental way to represent imagination?
Imagination is not evolution (not random).



Approach
- Use existing tools
  For NLP, analysis, etc.
  How can they be modified to suit my needs?
- Plan for tomorrow
  The computers of tomorrow will be able to handle much larger problems,
  can I limit this project to a certain subset of information planning on more
  powerful computes to handle larger subsets?
- Building the base
  How can I avoid manual encoding, in favor of learning
  Hand coded systems are not scalable, and they are not easily changeable (brittle).
  What about real time learning and reference consultation for specific problem solving?
- Interaction
  How can I interact with the user to learn/refine results/better understand
  Imagine new things?



Checkpoints
- Focus
    Understand the individual problems and define overall approach to achieve useful results
    Define the role of imagination and the knowledge representation (what will make this project different)
    If there is one thing I've learned, its how many problems there are to solve in this topic
- Analysis
    Understanding the text input
    Representing the knowledge acquired
- Imagination
    Applying new paradigms to the knowledge acquired
- Generation
    Prove understanding
    Answer questions about the meaning
    Understand when questions are unrelated
    Acquire knowledge as necessary
    Imagine?

Fallback
- NLP Tools
    What tools can I use that exist already?
- Interaction only
    One way of proving understanding is intelligent conversation (interaction)
    An interaction only system can take the place of the full generation phase.

Advisor

Professor Michael G. Dyer
UCLA Computer Science Department

Thank you for agreeing to advise me
and suggesting this project topic!

Sources

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