CS6700 Advanced AI

Prof. Carla Gomes Prof. Bart Selman

Projects

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Very open-ended
Go for BIG ideas! (No such thing as "failure."
Empirically driven building on foundational insights.)
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E.g.

Can you evolve a language from scratch?

Can you learn from "reading"? (E.g. game play from text on discussion boards)

Mechanical Turk --- Human-computing hybrids

Mine info from twitter feeds

Boost game play via "mimicry"

Projects

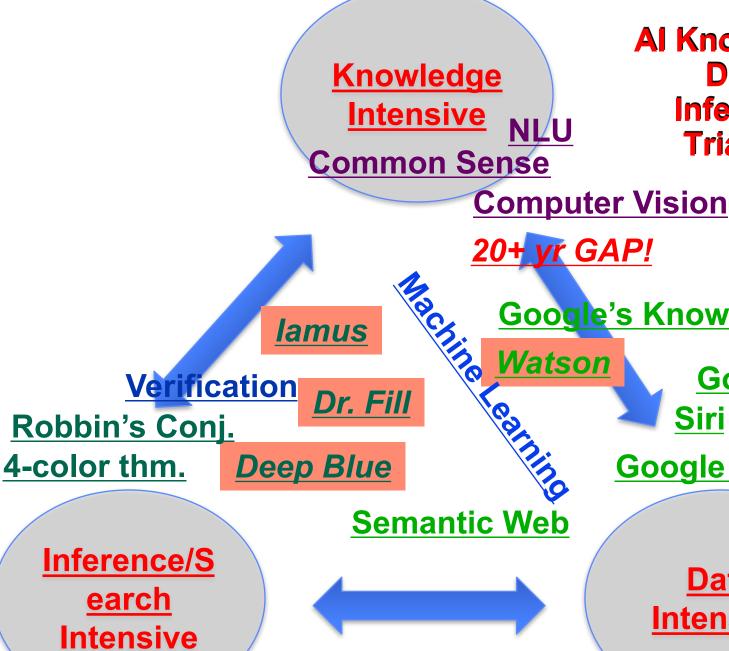
Cont.

Deep learning: still many "mysteries"

E.g. Google's alphaGo example of successful reinforcement learning using deep nets but what about deep learning chess through self-play?

Student project 4701 last semester: works reasonably but hits a limit; end game: can't figure out it needs to checkmate the opponent! Can we explain this? Fix this?

Scientific discovery --- in discrete math and materials science. (Slides: "Non-Human Intelligence")



Al Knowledge-Data-Inference **Triangle**

Google's Knowl. Graph

Google Transl.

Google Search (IR)

Data Intensive

Knowledge or Data?

Last 5 yrs: New direction.

Combine a few general principles / rules (i.e.

knowledge) with training (ML) on a large expert data set to tune hundreds of model parameters.

Obtain world-expert performance using inference.

Examples:

- --- IBM's Watson / Jeopardy
- --- Dr. Fill / NYT crosswords
- --- lamus / Classical music composition
- --- Google's alphaGo (deep learning)
- --- computer vision (deep learning)
- --- language translation (deep learning)

Performance: (several) Top 50 or better in the world! Is this the key to human expert intelligence?