Artificial Intelligence Reading Club

Chapter01 and Chapter02

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10/19/2020

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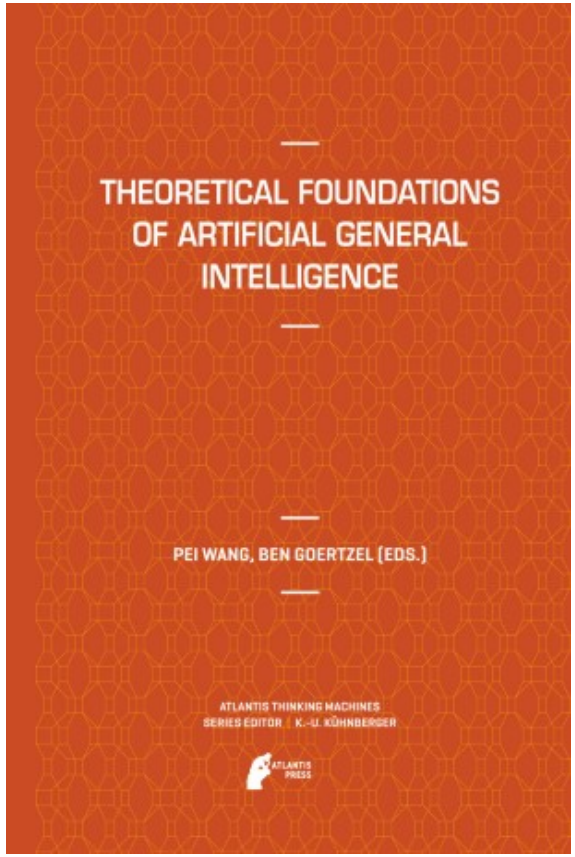
1.About Phil003 Reading Club

Purpose

This reading club focuses on the establishment of new theories and paradigms in AI/AGI. At the same time, the series aims at exploring multiple scientific angles and methodologies, including results from research in cognitive **science**, **neuroscience**, **theoretical and experimental AI**, **biology**, and from **innovative interdisciplinary methodologies**.

1.About Phil003 Reading Club

Theoretical Foundations of Artificial General Intelligence (Pei Wang Ben Goertzel, 2012)



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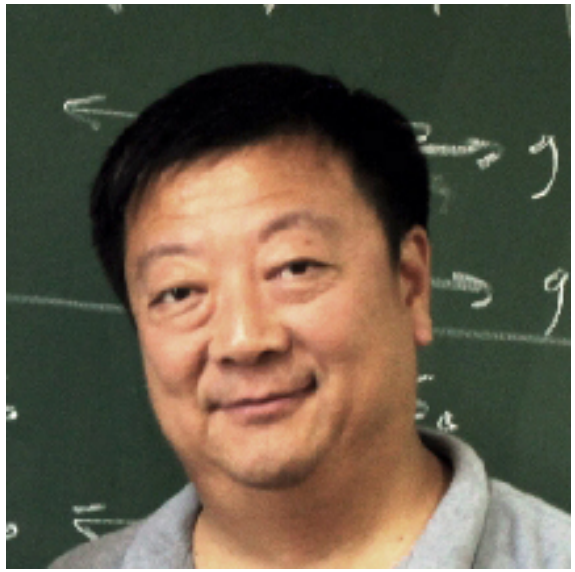

(a) Pei Wang

(b) Ben Goertzel

1.About Phil003 Reading Club

Contents of Reading Club

Chapter 1: Introduction (10/19/2020)
Chapter 2: Artificial Intelligence and Cognitive Modeling Have the Same Problem (10/19/2020)
Chapter 3: The Piaget-MacGuyver Room (10/26/2020)
Chapter 4: Beyond the Octopus: From General Intelligence toward a Human-like Mind (11/02/2020)
Chapter 5: One Decade of Universal Artificial Intelligence 67 (11/09/2020)
Chapter 6: Deep Reinforcement Learning as Foundation for Artificial General Intelligence (11/16/2020)
Chapter 7: The LIDA Model as a Foundational Architecture for AGI (11/23/2020)
Chapter 8: The Architecture of Human-Like General Intelligence (11/30/2020)

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Chapter 9: A New Constructivist AI (12/07/2020)
Chapter 10: Towards an Actual Gödel Machine Implementation (12/07/2020)
Chapter 11: Artificial General Intelligence Begins with Recognition (12/14/2020)
Chapter 12: Theory Blending as a Framework for Creativity in Systems for General Intelligence (12/21/2020)
Chapter 13: Modeling Emotion and Affect (12/28/2020)
Chapter 14: AGI and Machine Consciousness (12/28/2020)
Chapter 15: Human and Machine Consciousness as a Boundary Effect in the Concept Analysis Mechanism (01/04/2021)
Chapter 16: Theories of Artificial Intelligence (01/11/2021)

1.About Phil003 Reading Club

Practical information

Instructors: Jing ZHU

TAs: Hao ZHAN, Ruoding Wang

Location: 南光一 320

Contact instructors and TAs: haozhan1993@gmail.com

WeChat Group: Add 'haozhan1993' to join the WeChat group.

Course discussion:
https://github.com/tquadrivium/XMUArtificialIntelligence/issues

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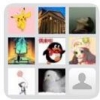

Phil003 AI Reading Club

该二维码7天内(10月25日前)有效，重新进入将更新

2.Introduction

Abstract

This chapter provides a general introduction to the volume, giving an overview of the AGI-field and the current need for exploration and clarification of its foundations, and briefly summarizing the contents of the various chapters.

2.Introduction

The Matter of Artificial General Intelligence

Artificial General Intelligence (AGI), roughly speaking, refers to AI research and development in which "intelligence" is understood as a general-purpose capability, not restricted to any narrow collection of problems or domains, and including the ability to broadly generalize to fundamentally new areas.

General AI VS Narrow AI

- specific problems
- data sets

ill posed problem...

2.Introduction

History

(1) Thinking Machines
not really thinking (Computers and Thought, p389)

(2) Domain-specific: early attempts failed to reach original goal
Not Symbolicism vs Connectionism

(3) Artificial General Intelligence
Most AGI researchers believe that general-purpose intelligent systems cannot be obtained by simply bundling special-purpose intelligent systems together, but have to be designed and developed differently

2.Introduction

The Matter of Theoretical Foundation

what intelligence is?
how to realize it in artifacts?

Symbolic Form

As part of the process of shaping and growing an AGI project, that these ideas be clarified, justified, and organized into a coherent theory.

Many times the theory associated with an AGI project is partially presented in a formal and symbolic form, to reduce the ambiguity and fuzziness in natural languages;

2.Introduction

Three Groups

(1) The nature of the AGI problem and the objective of AGI research

(2) AGI design methodology and system architecture

(3) The crucial challenges facing AI research

2.Introduction

A.The Matter of Objective

(1) Perception Module and Actuation Module
Artificial Intelligence and Cognitive Modeling Have the Same Problem, Chapter 02

(2) Evaluate and Measure
The Piaget-MacGuyver Room, Chapter 03

(3) Ladder of intelligence
Beyond the Octopus: From General Intelligence toward a Human-likeMind, Chapter 04

(4) To capture the essence of intelligence
One Decade of Universal Artificial Intelligence, Chapter 05

B.The Matter of Approach

Architecture: General AI VS Narrow AI

(5) Perception Module and Actuation Module

Deep Reinforcement Learning as Foundation for Artificial General Intelligence, Chapter 06

(6) Psychology and other Discipline

The LIDA Model as a Foundational Architecture for AGI, Chapter 07

(7) Integrative Architecture Diagram: Cognitive synergy

The Architecture of Human-Like General Intelligence, Chapter 08

B.The Matter of Approach

Architecture: General AI VS Narrow AI

(8) Constructivist: self-organizing architectures and self-generated code
A New Constructivist AI, Chapter 09

(9) Self-Reflective
Towards an Actual Gödel Machine Implementation, Chapter 10

C.Challenges at the Heart of the Matter

(10) Bidirectional "feedforward-feedback"
Artificial General Intelligence Begins with Recognition, Chapter 11

(11) Modeling Creativity / Transfer Learning
Theory Blending as a Framework for Creativity in Systems for General Intelligence, Chapter 12

(12) Affective Computing
Modeling Emotion and Affect, Chapter 13

C.Challenges at the Heart of the Matter

(13) Consciousness
AGI and Machine Consciousness, Chapter 14

(14) Philosophical Concepts
Human and Machine Consciousness as a Boundary Effect in the Concept Analysis Mechanism, Chapter 15

3.Conclusion

Where is the philosophy

Among the problems of AGI, many are theoretical in nature, and must be solved by theoretical analysis –which in turn, must often be inspired and informed by experimental and engineering work.

Thank you for your time!