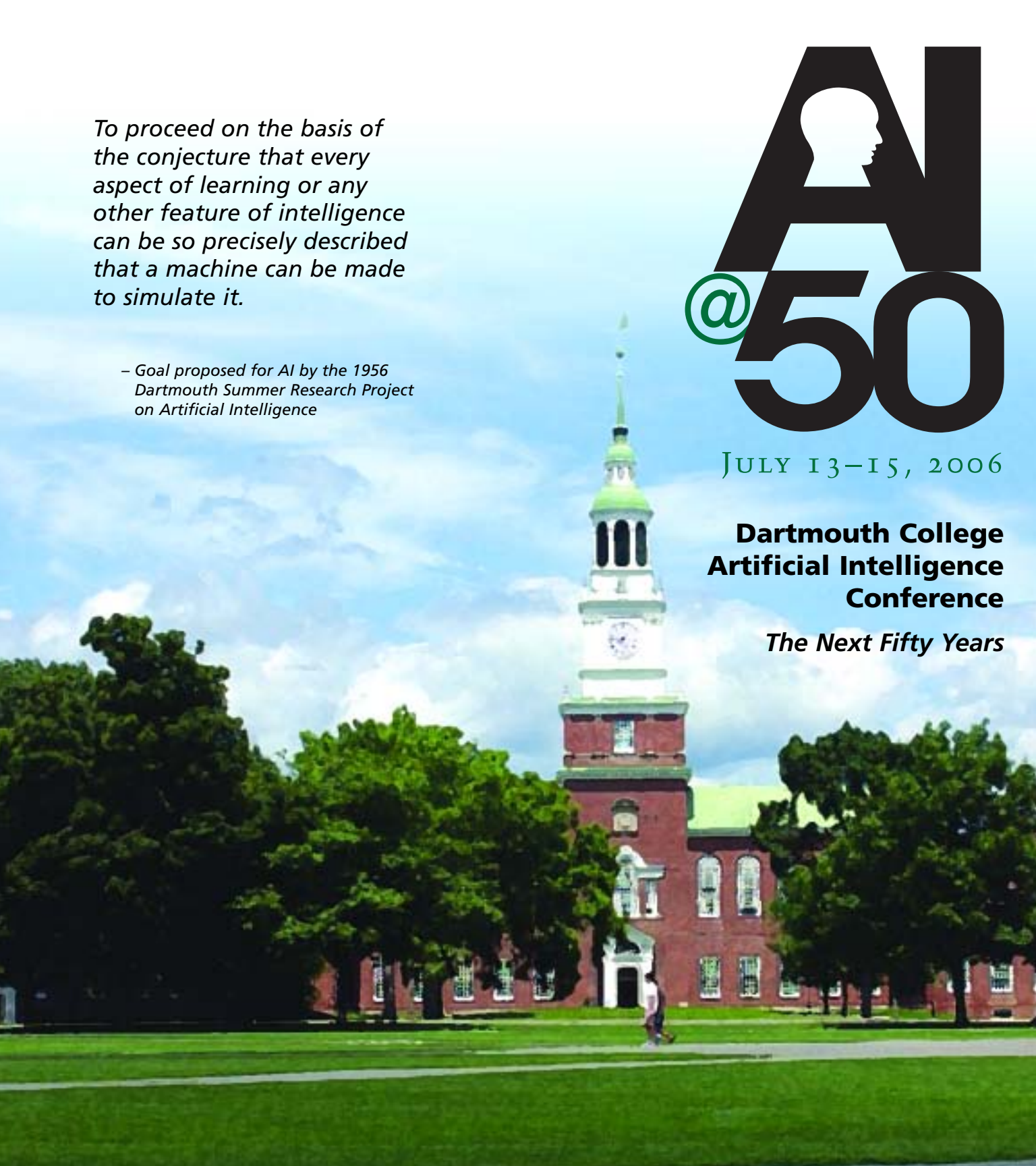
To proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can be so precisely described that a machine can be made to simulate it.

– Goal proposed for AI by the 1956 Dartmouth Summer Research Project on Artificial Intelligence



AI@50

July 13–15, 2006

Dartmouth College Artificial Intelligence Conference

The Next Fifty Years

AI@50 Co-Sponsored by:

Office of the Dean of the Faculty,
Dartmouth College

Office of the Provost,
Dartmouth College

The project is also sponsored in part
through a grant from the

Defense Advanced Research Projects Agency

The content of the information does not necessarily
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No official endorsement should be inferred.

We wish to express our gratitude to
these cooperating organizations:

Turning Technologies, LLC
of Youngstown, Ohio, generously supplied its
TurningPoint audience response system used
extensively during AI@50.

AI50 Advisory Committee:

Chris Bailey-Kellogg
Devin Balkcom
George Cybenko
Bruce Donald
Scot Drysdale
Kevin Dunbar
Hany Farid
Danny Kopec
John Kulvicki
Dan Rockmore
Joe Rosen
Adina Roskies
Eugene Santos Jr.
Paul Thompson
George Wolford

Welcome!

Fifty years ago, pioneer AI researchers gathered on this campus for their first-ever meeting in 1956, convening the Dartmouth Summer Research Project on Artificial Intelligence. The term itself had to be coined by John McCarthy, then a Dartmouth math professor, to apply for a grant to fund the original project. By end of summer, one of the first AI operating programs, Simon and Newell's Logic Theorist, had presented demonstrable proof of a future for AI through digital computer development.

This summer, the College commemorates that Summer Research Project by again hosting the 2006 Dartmouth Artificial Intelligence Conference: The Next Fifty Years, over July 13-15. We wish to thank the Office of the Dean of the Faculty and the Office of the Provost for their originating support toward forwarding progress on AI into the 21st century.

We also want to thank the Frederick B. Whittemore Foundation and the General Electric Foundation for additional funding, and most especially the Defense Advanced Research Projects Agency (DARPA) for its generous support, which has allowed AI@50 to invite twenty-five young post docs to attend this 2006 Conference.

At a like juncture in time, may these new scholars bring equal commitment and aspiration to AI research that so drove the achievements for artificial intelligence, out of that distant summer of speculation and logic and vision, half a century ago.

Director
James Moor

Steering Committee
Brock Brower
Carey Heckman

Thursday, July 13th

8:30 Opening

Moore Hall, Filene Auditorium

Jim Moor, *Introduction*

Carol Folt, *Welcome*

Carey Heckman, *Tonypandy and the Origins of a Science*

9:00 AI – Past, Present, Future

John McCarthy
What Was Expected, What We Did, and AI Today

Marvin Minsky
The Emotion Machine

10:00 Break

10:15 The Future Model of Thinking

Ron Brachman & Hector Levesque
A Large Part of Human Thought

David Mumford
What is the Right Model for "Thought"?

Stuart Russell
The Approach of Modern AI

11:45 Lunch

1:00 The Future of Network Models

Geoffrey Hinton & Simon Osindero
From Pandemonium to Graphical Models and Back Again

Rick Granger
From Brain Circuits to Mind Manufacture

2:00 Break

2:15 The Future of Learning & Search

Oliver Selfridge
Learning and Education for Software: New Approaches in Machine Learning

Ray Solomonoff
Machine Learning - Past and Future

Leslie Pack Kaelbling
Learning to be Intelligent

Peter Norvig
Web Search as a Product of and Catalyst for AI

4:00 Break

4:30 Film Preview,

Hood Museum, Loew Auditorium

Mind in the Machine: The Discovery of Artificial Intelligence
A sneak preview of the video documentary by Wendy Conquest, Bob Drake, and Dan Rockmore

7:00 Reception, *Collis Common Ground*

Original Conference Participants Reflect on the 1956 Conference

John McCarthy
Marvin Minsky
Trenchard More
Ray Solomonoff
Oliver Selfridge

8:00 Banquet, *Collis Common Ground*

Friday, July 14th

8:30 The Future of AI

Rod Brooks
Intelligence and Bodies

Nils Nilsson
Routes to the Summit

Eric Horvitz
In Pursuit of Artificial Intelligence: Reflections on Challenges and Trajectories

10:00 Break

10:15 The Future of Vision

Eric Grimson
Intelligent Medical Image Analysis: Computer Assisted Surgery and Disease Monitoring

Takeo Kanade
Artificial Intelligence Vision: Progress and Non-Progress

Terry Sejnowski
A Critique of Pure Vision

11:45 Lunch

1:00 The Future of Reasoning

Alan Bundy
Constructing, Selecting and Repairing Representations of Knowledge

Edwina Rissland
The Exquisite Centrality of Examples

Bart Selman
The Challenge and Promise of Automated Reasoning

2:30 Break

2:45 The Future of Language and Cognition

Trenchard More
The Birth of Array Theory and Nial

Eugene Charniak
Why Natural Language Processing is Now Statistical Natural Language Processing

Pat Langley
Intelligent Behavior in Humans and Machines

4:15 The Future of the Future

Ray Kurzweil
Why We Can Be Confident of Turing Test Capability Within a Quarter Century

4:45 Break

5:00 Reception and Dinner
DOC House

7:00 The Future Trajectory of AI
DOC House

George Cybenko
Charles Holland
DARPA's Perspective

Saturday, July 15th

9:00 AI and Games

Jonathan Schaeffer
Games as a Test-bed for Artificial Intelligence Research

Danny Kopec
Chess and AI

Shay Bushinsky
Principle Positions in Deep Junior's Development

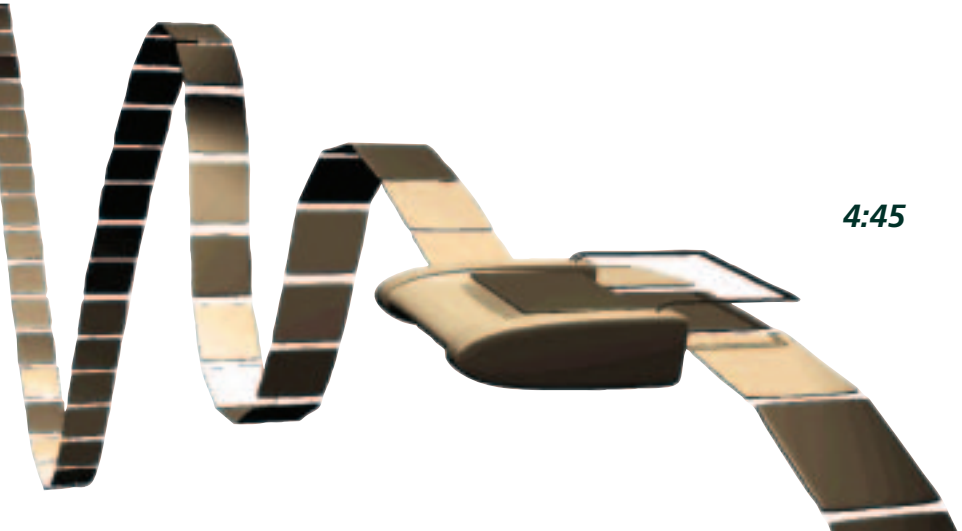
10:45 Break

11:00 Future Interactions with Intelligent Machines

Daniela Rus
Making Bodies Smart

Sherry Turkle
From Building Intelligences to Nurturing Sensibilities

12:00 Lunch



1:00 Selected Submitted Papers: Future Strategies for AI

J. Storrs Hall
Self-improving AI: An Analysis

Selmer Bringsjord
The Logicist Manifesto

Vincent Müller
Is There a Future for AI Without Representation?

2:30 Break

2:45 Selected Submitted Papers: Future Possibilities for AI

Eric Steinhart
Survival as a Digital Ghost

C.T.A. Schmidt
Did You Leave That "Contraption" Alone With Your Little Sister?

Michael Anderson & Susan Leigh Anderson
The Status of Machine Ethics

Marcello Guarini
Computation, Coherence, and Ethical Reasoning

4:45 Concluding Remarks

MIND IN THE MACHINE:
THE DISCOVERY OF ARTIFICIAL INTELLIGENCE

A film produced by Dartmouth Professor of Mathematics and Computer Science Dan Rockmore and documentary filmmakers Wendy Conquest and Bob Drake – will debut during AI@50. Public television perfomance is anticipated and inquiries regarding distribution should be directed to Dan Rockmore at rockmore@cs.dartmouth.edu.

ORIGINS OF A SCIENCE:
50TH ANNIVERSARY OF ARTIFICIAL INTELLIGENCE

An installation created by Dartmouth Adjunct Professor of Philosophy Carey Heckman, Dartmouth undergraduate Ben Schiffman '07, and Dartmouth Library staff members Ann Perbohner and Dennis Grady, will remain on display in the Main Hall of Baker Library throughout the summer.

HISTORY OF COMPUTER GAMES EXHIBIT

Organized by Brooklyn College Professor of Computer Science and Chess International Master Danny Kopec and Brooklyn College Professor and Reference Librarian Jill Cirasella.

Speakers from the Original 1956 Conference:

John McCarthy, *Stanford*
Marvin Minsky, *MIT*
Trenchard More, *IBM (retired)*
Ray Solomonoff, *London*
Oliver Selfridge, *MIT*

Additional 2006 Speakers:

Ron Brachman, *Yahoo! Research*
Rod Brooks, *MIT*
Alan Bundy, *Edinburgh*
Shay Bushinsky, *Haifa*
Eugene Charniak, *Brown*
Richard Granger, *Dartmouth*
Eric Grimson, *MIT*
Geoffrey Hinton, *Toronto*
Charles Holland, *DARPA*
Eric Horvitz, *Microsoft Research*
Leslie Pack Kaelbling, *MIT*
Takeo Kanade, *Carnegie Mellon*
Danny Kopec, *Brooklyn*
Ray Kurzweil, *Kurzweil Technologies, Inc.*
Pat Langley, *Stanford*
Hector Levesque, *Toronto*
David Mumford, *Brown*
Nils Nilsson, *Stanford*
Peter Norvig, *Google*
Simon Osindero, *Toronto*
Edwina Rissland, *UMASS*
Daniela Rus, *MIT*
Stuart Russell, *Berkeley*
Jonathan Schaeffer, *Alberta*
Terry Sejnowski, *SALK Institute*
Bart Selman, *Cornell*
Sherry Turkle, *MIT*