Autonomous Agents From Self Control To Autonomy

This book offers a unified collection of

published and unpublished papers by Robert Audi, a renowned defender of the rationalist position in ethics. Taken together, the essays present a vigorous, broadly-based argument in moral

epistemology and a related account of reasons for action and their bearing on moral justification and moral character. Part I details Audi's compelling moral epistemology while Part II offers a unique

vision of ethical concepts and an account of moral explanation, as well as a powerful model of moral realism. Part III extends this account of moral explanation to moral responsibility

for both actions and character and to the relation between virtue and the actions that express it. Part IV elaborates a theory of reasons for action that locates them in relation to three of their

traditionally major sources: desire, moral judgment, and value. Clear and illuminating, Audi's introduction outlines and interconnects the self-contained but cumulatively arranged essays.

It also places them in relation to classical and contemporary literature, and directs readers to large segments of thematically connected material spread throughout the book. Audi ends with a

powerfully synthetic final essay.

Starting with an analysis of these conditions and an exploration of their complex causes, Giordano then proceeds to address legal and ethical dilemmas such as

a patient's refusal of life-saving treatment. The book is illustrated with many case-studies.

An autonomous agent is a computational system that acquires sensory data from its

environment and decides by itself how to relate the external stimulus to its behaviors in order to attain certain goals. Responding to different stimuli received from its task environment, the

agent may select and exhibit different behavioral patterns. The behavioral patterns may be carefully predefined or dynamically acquired by the agent based on some learning and adaptation

mechanism(s). In order to achieve structural flexibility, reliability through redundancy, adaptability, and reconfigurability in real-world tasks, some researchers have started to address the

issue of multiagent cooperation. Broadly speaking, the power of autonomous agents lies in their ability to deal with unpredictable, dynamically changing environments.

Agent-based systems are becoming one of the most important computer technologies, holding out many promises for solving real-world problems. The aims of this book are to provide a guided

tour to the pioneering work and the major technical issues in agent research, and to give an in-depth discussion on the computational mechanisms for behavioral engineering in autonomous

agents. Through a systematic examination, the book attempts to provide the general design principles for building autonomous agents and the analytical tools for modeling the emerged behavioral

properties of a multiagent system. Contents: Behavioral Modeling, Planning, and Learning; Synthetic Autonomy; Dynamics of Distributed Computation; Self-Organized

Autonomy in Multi-Agent Systems; Autonomy-Oriented Computation; Dynamics and Complexity of Autonomy-Oriented Computation. Readership: Undergraduate and graduate students in computer science

and most engineering disciplines, as well as computer scientists, engineers, researchers and practitioners in the field of machine intelligence. A comprehensive survey of the growing field of

self-reconfigurable robots that discusses the history of the field, design considerations, and control strategies. Self-reconfigurable robots are constructed of robotic modules that can be

connected in many different ways. These modules move in relationship to each other, which allows the robot as a whole to change shape. This shapeshifting makes it possible for the robots to adapt

and optimize their shapes for different tasks. Thus, a self-reconfigurable robot can first assume the shape of a rolling track to cover distance quickly, then the shape of a snake to explore a narrow space,

and finally the shape of a hexapod to carry an artifact back to the starting point. The field of self-reconfigurable robots has seen significant progress over the last twenty years, and this book collects

and synthesizes existing research previously only available in widely scattered individual papers, offering an accessible guide to the latest information on s elf-reconfigurable

robots for researchers and students interested in the field. Self-Reconfigurable Robots focuses on conveying the intuition behind the design and control of self-reconfigurable robots rather than technical

details. Suggestions for further reading refer readers to the underlying sources of technical information. The book includes descriptions of existing robots and a brief history of the field;

discussion of module design considerations, including module geometry, connector design, and computing and communication infrastructure; an in-depth presentation of strategies for controlling self-

reconfiguration and locomotion; and exploration of future research challenges.

The Biology, Intelligence, and Technology of Self-Organizing Machines

Jan Narveson and the Defence of

Libertarianism An Introduction

Liberation from Self

Autonomous Agents and Multi-agent Systems

Self-reconfigurable Robots

A comprehensive survey of

artificial intelligence algorithms and programming organization for robot systems, combining theoretical rigor and practical

applications. This textbook offers a comprehensive survey of artificial intelligence (AI) algorithms and programming organization for robot

systems. Readers who master the topics covered will be able to design and evaluate an artificially intelligent robot for applications involving

sensing, acting, planning, and learning. A background in AI is not required; the book introduces key AI topics from all AI subdisciplines

throughout the book and explains how they contribute to autonomous capabilities. This second edition is a major expansion and reorganization

of the first edition, reflecting the dramatic advances made in AI over the past fifteen years. An introductory overview provides a

framework for thinking about AI for robotics, distinguishing between the fundamentally different design paradigms of automation and autonomy. The book then

discusses the reactive functionality of sensing and acting in AI robotics; introduces the deliberative functions most often associated with

intelligence and the capability of autonomous initiative; surveys multi-robot systems and (in a new chapter) human-robot interaction; and offers a

"metaview" of how to design and evaluate autonomous systems and the ethical considerations in doing so. New material covers locomotion, simultaneous

localization and mapping, human-robot interaction, machine learning, and ethics. Each chapter includes exercises, and many chapters provide case

studies. Endnotes point to additional reading, highlight advanced topics, and offer robot trivia.

This book examines

issues raised by feminist theory and contemporary political theory around questions of identity and autonomy. Drawing on Hegel, Wollstonecraft

, Mill and de Beauvoir, it also features illustrative examples of real-world issues and dilemmas. An introduction to the science and practice of

autonomous robots that reviews over 300 current systems and examines the underlying technology. Autonomous robots are intelligent machines

capable of performing tasks in the world by themselves, without explicit human control. Examples range from autonomous helicopters to

Roomba, the robot vacuum cleaner. In this book, George Bekey offers an introduction to the science and practice of autonomous robots that can be used

both in the classroom and as a reference for industry professionals. He surveys the hardware implementations of more than 300 current systems, reviews some

of their application areas, and examines the underlying technology, including control, architectures, learning, manipulation, grasping,

navigation, and mapping. Living systems can be considered the prototypes of autonomous systems, and Bekey explores the biological inspiration

that forms the basis of many recent developments in robotics. He also discusses robot control issues and the design of control architectures. After an

overview of the field that introduces some of its fundamental concepts, the book presents background material on hardware, control (from both biological

and engineering perspectives), software architecture, and robot intelligence. It then examines a broad range of implementations and applications,

including locomotion (wheeled, legged, flying, swimming, and crawling robots), manipulation (both arms and hands), localization, navigation,

and mapping. The many case studies and specific applications include robots built for research, industry, and the military, among them underwater

robotic vehicles, walking machines with four, six, and eight legs, and the famous humanoid robots Cog, Kismet, ASIMO, and QRIO. The

book concludes with reflections on the future of robotics—the potential benefits as well as the possible dangers that may arise from large

numbers of increasingly intelligent and autonomous robots. Time-Critical Cooperative Control of Autonomous Air Vehicles presents, in an easy-to-read

style, the latest research conducted in the industry, while also introducing a set of novel ideas that illuminate a new approach to problem-

solving. The book is virtually self-contained, giving the reader a complete, integrated presentation of the different concepts,

mathematical tools, and control solutions needed to tackle and solve a number of problems concerning time-critical cooperative

control of UAVs. By including case studies of fixed-wing and multirotor UAVs, the book effectively broadens the scope of application of

the methodologies developed. This theoretical presentation is complemented with the results of flight tests with real

UAVs, and is an ideal reference for researchers and practitioners from academia, research labs, commercial companies, government

workers, and those in the international aerospace industry. Addresses important topics related to time-critical cooperative control of UAVs

Describes solutions to the problems rooted in solid dynamical systems theory Applies the solutions developed to fixed-wing and multirotor UAVs Includes

the results of field tests with both classes of UAVs

Technical, Legal and Social Aspects

Mechanics of Robotic Manipulation

Programming Multi-Agent

Systems Autonomy and Identity
New Essays on Personal Autonomy and its Role in Contemporary Moral Philosophy
Conceptual and Ethical

Issues in the Treatment of Anorexia and Bulimia Nervosa

This is the most detailed, sophisticated and comprehensive treatment of autonomy currently available. Moreover it argues for a quite different conception of autonomy from that

found in the philosophical literature. Professor Berofsky claims that the idea of autonomy as origination in the self is a seductive but ultimately illusory one. The only serious way of approaching the subject is to pay due attention to psychology, and to view autonomy as the liberation from the disabling effects of

physiological and psychological afflictions. Self-control has gained enormous attention in recent years both in philosophy and the mind sciences, for it has profound implications on so many aspects of human life. Overcoming temptation, improving cognitive functioning, making life-altering decisions, and numerous

other challenges all depend upon self-control. But recent developments in the philosophy of mind and in action theory, as well as in psychology, are now testing some of the assumptions about the nature of self-control previously held on purely a priori grounds. New essays in this volume offer fresh insights from

a variety of angles: neuroscience; social, cognitive, and developmental psychology; decision theory; and philosophy. While much of the literature on self-control is spread across distinct disciplines and journals, this volume presents for the first time a thorough and truly interdisciplinary

exploration of the topic. The essays address four central topics: what self-control is and how it works; temptation and goal pursuit; self-control, morality, and law; and extending self-control. They take up an array of complex and important questions. What is self-control? How is self-control related to willpower? How does

inhibitory control work? What are the cultural and developmental origins of beliefs about self-control? How are attempts at self-control hindered or helped by emotions? How do our beliefs about our own ability to deal with temptation influence our behavior? What does the ability to avoid temptation depend on?

How should juvenile responsibility be understood, and how should the juvenile justice system be reformed? Can an account of self-control help us understand free will? Combining the most recent scientific research with new frontiers in the philosophy of mind, this volume offers the most definitive guide to self-

control to date. The essays in this volume explore various issues pertaining to human agency, such as the relationship between free will and causal determinism, and the nature and conditions of moral responsibility. Builds on and extends some of the very best recent work in the field. Features lively and

vigorous debate. Forges connections between abstract philosophical theorizing and applied work in neuroscience and even criminal law. Autonomy has recently become one of the central concepts in contemporary moral philosophy and has generated much debate over its nature and value. This 2005 volume brings

together essays that address the theoretical foundations of the concept of autonomy, as well as essays that investigate the relationship between autonomy and moral responsibility, freedom, political philosophy, and medical ethics. Written by some of the most prominent philosophers working in these areas,

this book represents research on the nature and value of autonomy that will be essential reading for a broad swathe of philosophers as well as many psychologists.

Autonomous Agents

Midwest Studies in Philosophy, Free Will and Moral Responsibility

Structures of Agency

Routledge Library

Editions: Artificial Intelligence

Personal Autonomy

17th European Conference on Artificial Intelligence, August 29 - September 1, 2006, Riva Del Garda, Italy ; Including: Prestigious Applications of Intelligent Systems (PAIS 2006) ; Proceedings

This book constitutes the thoroughly

refereed post-proceedings of the Third International Workshop on Programming Multi-Agent Systems, ProMAS 2005, held in Utrecht, The Netherlands in July 2005 as an associated event of AAMAS 2005, the main international conference on

autonomous agents and multi-agent systems. The 14 revised full papers presented together with 2 invited articles are organized in topical sections on multi-agent techniques and issues, multi-agent programming, and multi-agent platforms and organization.

"Artificial Intelligence" (AI) a term coined in the 1950s actually dates back as far as 1943. Now very much in the public consciousness, AI research has fallen in and out of favour over the years. Routledge Library Editions: Artificial Intelligence (10 Volumes) brings together as one set,

or individual volumes, a small interdisciplinary series of previously out-of-print titles, originally published between 1970 and 1994. Covering ground in computer science, literature, philosophy, psychology, psychotherapy and sociology, this set is a fascinating insight into

the development of ideas surrounding AI. Jan Narveson is one of the most significant contemporary defenders of the libertarian political position. Unlike other libertarians who typically defend their view with reference to natural rights or an appeal to utilitarianism,

Narveson's main contribution has been to offer a philosophical defence of libertarianism based on a Hobbesian individualist contractarian ethic. Critiques of Narveson's contractarian libertarianism fall into three categories,

those that reject contractarian moral theory, those that reject any link between contractarianism and libertarianism and those that accuse libertarians of conflating liberty with property. In this book Malcolm Murray brings together the most significant of

Narveson's critics and presents their work alongside replies by Jan Narveson.

Autonomous AgentsFrom Self-control to AutonomyOxford University Press on Demand

Potential, Risks, and Solutions

A Dynamical Systems Approach

The Autonomous Animal

Liberty, Games and Contracts

Understanding Eating Disorders

Time-Critical Cooperative Control of Autonomous Air Vehicles

An overview of the basic concepts and

methodologies of evolutionary robotics, which views robots as autonomous artificial organisms that develop their own skills in close interaction with the environment and

without human intervention. A broadly accessible introduction to robotics that spans the most basic concepts and the most novel applications; for students, teachers, and

hobbyists. The Robotics Primer offers a broadly accessible introduction to robotics for students at pre-university and university levels, robot hobbyists, and anyone

interested in this burgeoning field. The text takes the reader from the most basic concepts (including perception and movement) to the most novel and sophisticated

applications and topics (humanoids, shape-shifting robots, space robotics), with an emphasis on what it takes to create autonomous intelligent robot behavior. The core

concepts of robotics are carried through from fundamental definitions to more complex explanations, all presented in an engaging, conversational style that will appeal to

readers of different backgrounds. The Robotics Primer covers such topics as the definition of robotics, the history of robotics ("Where do Robots Come From?"), robot

components,
locomotion,
manipulation,
sensors,
control,
control
architectures,
representation,
behavior
(“Making Your
Robot Behave”),
navigation,
group robotics,

learning, and the future of robotics (and its ethical implications). To encourage further engagement, exp erimentation, and course and lesson design, The Robotics Primer is

accompanied by a free robot programming exercise workbook that implements many of the ideas on the book on iRobot platforms. The Robotics Primer is unique as a principled,

pedagogical treatment of the topic that is accessible to a broad audience; the only prerequisites are curiosity and attention. It can be used effectively in an educational

setting or more informally for self-instruction.

The Robotics Primer is a springboard for readers of all backgrounds—inc luding students taking robotics as an elective outside the

major, graduate students preparing to specialize in robotics, and K-12 teachers who bring robotics into their classrooms. Methods by which robots can learn

control laws that enable real-time reactivity using dynamical systems; with applications and exercises. This book presents a wealth of machine learning

techniques to make the control of robots more flexible and safe when interacting with humans. It introduces a set of control laws that enable reactivity

using dynamical systems, a widely used method for solving motion-planning problems in robotics. These control approaches can replan in milliseconds to adapt to new

environmental constraints and offer safe and compliant control of forces in contact. The techniques offer theoretical advantages, including convergence to

a goal, non-penetration of obstacles, and passivity. The coverage of learning begins with low-level control parameters and progresses to higher-level competencies composed of

combinations of skills.

Learning for Adaptive and Reactive Robot Control is designed for graduate-level courses in robotics, with chapters that proceed from fundamentals to

more advanced content. Techniques covered include learning from demonstration, optimization, and reinforcement learning, and using dynamical systems in learning

control laws, trajectory planning, and methods for compliant and force control . Features for teaching in each chapter: • applications, which range from arm manipulators to

whole-body control of humanoid robots; • penci l-and-paper and programming exercises; • lecture videos, slides, and MATLAB code examples available on the author’s

website . • an eTextbook platform website offering protected material[EPS2] for instructors including solutions.
A wide-ranging reexamination of a

foundational tenet of modern democratic society Behavior-based Robotics Intelligent Agents VII. Agent Theories Architectures and Languages The Politics of Who We Are.

Introduction to Autonomous Mobile Robots, second edition

The Biology and Technology of Intelligent Autonomous Agents

Introduction to AI Robotics, second edition

The first textbook on

micron-scale mobile robotics, introducing the fundamentals of design, analysis, fabrication, and control, and drawing on case studies of existing approaches. Progress in micro- and nano-scale science and technology has created a demand for new microsystems for high-impact applications in healthcare,

biotechnology, manufacturing, and mobile sensor networks. The new robotics field of microrobotics has emerged to extend our interactions and explorations to sub-millimeter scales. This is the first textbook on micron-scale mobile robotics, introducing the fundamentals of design, analysis, fabrication,

and control, and drawing on case studies of existing approaches. The book covers the scaling laws that can be used to determine the dominant forces and effects at the micron scale; models forces acting on microrobots, including surface forces, friction, and viscous drag; and describes such possible

microfabrication techniques as photo-lithography, bulk micromachining, and deep reactive ion etching. It presents on-board and remote sensing methods, noting that remote sensors are currently more feasible; studies possible on-board microactuators; discusses self-propulsion methods that

use self-generated local gradients and fields or biological cells in liquid environments; and describes remote microrobot actuation methods for use in limited spaces such as inside the human body. It covers possible on-board powering methods, indispensable in future medical and other applications;

locomotion methods for robots on surfaces, in liquids, in air, and on fluid-air interfaces; and the challenges of microrobot localization and control, in particular multi-robot control methods for magnetic microrobots. Finally, the book addresses current and future applications, including noninvasive medical diagnosis and

treatment, environmental remediation, and scientific tools.
Mele argues that even an ideally self-controlled person can fall short of personal autonomy and examines what needs to be added to such a person to yield an autonomous agent.
"...Mele has hit his mark in this well-argued,

engaging, and thought-provoking book."--The Review of Metaphysics Foreword by Michael Arbib This introduction to the principles, design, and practice of intelligent behavior-based autonomous robotic systems is the first true survey of this robotics field. The author presents the tools and techniques central

to the development of this class of systems in a clear and thorough manner. Following a discussion of the relevant biological and psychological models of behavior, he covers the use of knowledge and learning in autonomous robots, behavior-based and hybrid robot architectures, modular perception, robot

colonies, and future trends in robot intelligence. The text throughout refers to actual implemented robots and includes many pictures and descriptions of hardware, making it clear that these are not abstract simulations, but real machines capable of perception, cognition, and action.

Mele's ultimate purpose in this book is to help readers think more clearly about free will. He identifies and makes vivid the most important conceptual obstacles to justified belief in the existence of free will and meets them head on. Mele clarifies the central issue in the philosophical debate about free will and

moral responsibility, criticizes various influential contemporary theories about free will, and develops two overlapping conceptions of free will - one for readers who are convinced that free will is incompatible with determinism (incompatibilists), and the other for readers who are convinced of

the opposite (compatibilists). Mele's theory offers an original perspective on an important problem and will garner the attention of anyone interested in the debate on free will.

Multiagent Systems

Essays

Building Embodied, Situated Agents

Autonomous Driving

Personal Autonomy in

Society

The Artificial Life Route to Artificial Intelligence

This book establishes the foundations needed to realize the ultimate goals for artificial intelligence, such as autonomy and

trustworthiness. Aimed at scientists, researchers, technologists, practitioners, and students, it brings together contributions offering the basics, the challenges and the state-of-the-art on trusted

autonomous systems in a single volume. The book is structured in three parts, with chapters written by eminent researchers and outstanding practitioners and users in the field. The first

part covers foundational artificial intelligence technologies, while the second part covers philosophical, practical and technological perspectives on trust. Lastly, the third part presents

advanced topics necessary to create future trusted autonomous systems. The book augments theory with real-world applications including cyber security, defence and space.

The new edition of an introduction to multiagent systems that captures the state of the art in both theory and practice, suitable as textbook or reference. Multiagent systems are made

up of multiple interacting intelligent agen ts—computational entities to some degree autonomous and able to cooperate, compete, communicate, act flexibly, and exercise control over their

behavior within the frame of their objectives. They are the enabling technology for a wide range of advanced applications relying on distributed and parallel processing of data,

information, and knowledge relevant in domains ranging from industrial manufacturing to e-commerce to health care. This book offers a state-of-the-art introduction to multiagent systems, covering the

field in both breadth and depth, and treating both theory and practice. It is suitable for classroom use or independent study. This second edition has been completely revised,

capturing the tremendous developments in multiagent systems since the first edition appeared in 1999. Sixteen of the book's seventeen chapters were written for this edition; all chapters are by

leaders in the field, with each author contributing to the broad base of knowledge and experience on which the book rests. The book covers basic concepts of computational agency from the perspective of

both individual agents and agent organizations; communication among agents; coordination among agents; distributed cognition; development and engineering of multiagent systems; and background

knowledge in logics and game theory. Each chapter includes references, many illustrations and examples, and exercises of varying degrees of difficulty. The chapters and the overall book are designed to be self-

contained and understandable without additional material. Supplemental resources are available on the book's Web site. Contributors Rafael Bordini, Felix Brandt, Amit Chopra, Vincent

Conitzer, Virginia Dignum, Jürgen Dix, Ed Durfee, Edith Elkind, Ulle Endriss, Alessandro Farinelli, Shaheen Fatima, Michael Fisher, Nicholas R. Jennings, Kevin Leyton-Brown, Evangelos

Markakis, Lin Padgham, Julian Padget, Iyad Rahwan, Talal Rahwan, Alex Rogers, Jordi Sabater-Mir, Yoav Shoham, Munindar P. Singh, Kagan Tumer, Karl Tuyls, Wiebe van der Hoek, Laurent

Vercouter, Meritxell Vinyals, Michael Winikoff, Michael Wooldridge, Shlomo Zilberstein

An agent is a system capable of perceiving the environment, reasoning with the percepts and

then acting upon the world. Agents can be purely software systems, in which case their percepts and output `actions' are encoded binary strings. However, agents can also be realized in hardware, and

then they are robots. The Artificial Intelligence community frequently views robots as embodied intelligent agents. The First International Conference on Autonomous

Agents was held in Santa Monica, California, in February 1997. This conference brought together researchers from around the world with interests in agents, whether implemented purely in software or in

hardware. The conference featured such topics as intelligent software agents, agents in virtual environments, agents in the entertainment industry, and robotic agents. Papers on

robotic agents were selected for this volume. Autonomous Agents will be of interest to researchers and students in the area of artificial intelligence and robotics.

This book takes a look at fully

automated, autonomous vehicles and discusses many open questions: How can autonomous vehicles be integrated into the current transportation system with diverse users and human

drivers? Where do automated vehicles fall under current legal frameworks? What risks are associated with automation and how will society respond to these risks? How will the marketplace react to

automated vehicles and what changes may be necessary for companies? Experts from Germany and the United States define key societal, engineering, and mobility issues related to the automation of

vehicles. They discuss the decisions programmers of automated vehicles must make to enable vehicles to perceive their environment, interact with other road users, and choose actions

that may have ethical consequences. The authors further identify expectations and concerns that will form the basis for individual and societal acceptance of autonomous driving. While

the safety benefits of such vehicles are tremendous, the authors demonstrate that these benefits will only be achieved if vehicles have an appropriate safety concept at the heart of their design.

Realizing the potential of automated vehicles to reorganize traffic and transform mobility of people and goods requires similar care in the design of vehicles and networks. By

covering all of these topics, the book aims to provide a current, comprehensive, and scientifically sound treatment of the emerging field of “autonomous driving". Learning for

Adaptive and Reactive Robot Control
Foundations of Trusted Autonomy
Encyclopedia of Ethics: P-W
Mobile Microrobotics
Explorations in Learning, Self-organization, and Adaptive Computation

Evolutionary Robotics

How can we capture the unpredictable evolutionary and emergent properties of nature in software? How can understanding the mathematical principles behind

our physical world help us to create digital worlds? This book focuses on a range of programming strategies and techniques behind computer simulations of natural systems, from elementary concepts in

mathematics and physics to more advanced algorithms that enable sophisticated visual results. Readers will progress from building a basic physics engine to creating intelligent moving objects

and complex systems, setting the foundation for further experiments in generative design. Subjects covered include forces, trigonometry, fractals, cellular automata, self-organization, and genetic

algorithms. The book's examples are written in Processing, an open-source language and development environment built on top of the Java programming language. On the book's website (http: //www.nature

ofcode.com), the examples run in the browser via Processing's JavaScript mode. A revised, expanded and updated edition with contributions by 325 renowned authorities in the field of ethics. All of the original

articles have been newly peer-reviewed and revised, bibliographies have been updated throughout, and the overall design of the work has been enhanced for easier access to cross-references and other

reference features. Originally published in 1995, this volume is the direct result of a conference in which a number of leading researchers from the fields of artificial intelligence and biology gathered

to examine whether there was any ground to assume that a new AI paradigm was forming itself and what the essential ingredients of this new paradigm were. A great deal of scepsis is justified when researchers,

particularly in the cognitive sciences, talk about a new paradigm. Shifts in paradigm mean not only new ideas but also shifts in what constitutes good problems, what counts as a result, the experimental

practice to validate results, and the technological tools needed to do research. Due to the complexity of the subject matter, paradigms abound in the cognitive sciences -- connectionism being the most prominent

newcomer in the mid-1980s. This workshop group was brought together in order to clarify the common ground, see what had been achieved so far, and examine in which way the research could move further. This

volume is a reflection of this important meeting. It contains contributions which were distributed before the workshop but then substantially broadened and revised to reflect the workshop discussions and

more recent technical work. Written in polemic form, sometimes criticizing the work done thus far within the new paradigm, this collection includes research program descriptions, technical contributions, and

position papers. The science and engineering of robotic manipulation. "Manipulation" refers to a variety of physical changes made to the world around us. Mechanics of Robotic Manipulation

addresses one form of robotic manipulation, moving objects, and the various processes involve d—grasping, carrying, pushing, dropping, throwing, and so on. Unlike most books on the subject, it focuses

on manipulation rather than manipulators. This attention to processes rather than devices allows a more fundamental approach, leading to results that apply to a broad range of devices, not just robotic

arms. The book draws both on classical mechanics and on classical planning, which introduces the element of imperfect information. The book does not propose a specific solution to the problem of

manipulation, but rather outlines a path of inquiry.

Freedom and Self-Creation

The Nature of Code

7th International Workshop, ATAL 2000, Boston, MA, USA, July 7-9, 2000. Proceedings Third International

Workshop, ProMAS 2005, Utrecht, The Netherlands, July 26, 2005, Revised and Invited Papers Surrounding Self-Control

Moral Knowledge and Ethical Character

This volume

contains the p ostproceeding s of the 1st International Workshop on Computational Autonomy – Potential, Risks, Solutions (AUTONOMY 2003), held at

the 2nd International Joint Conference on Autonomous Agents and Multi-agentSystems(AAMAS2003),July14,2003,Melbourne,Australia.Apart from revised

versions of the accepted workshop papers, we have included invited contributions from leading experts in the ?eld. With this, the present

volume represents the ?rst comprehensive survey of the state-of-the-art of research on autonomy, capturing di?erent theories of autonomy,

perspectives on autonomy in di?erent kinds of agent-based systems, and practical approaches to dealing with agent autonomy. Agent orientation

refers to a software development perspective that has evolved in the past 25 years in the ?elds of computational agents and multiagent systems. The

basic notion underlying this perspective is that of a computational agent, that is, an entity whose behavior deserves to be called ?exible,

social, and autonomous. As an autonomous entity, an agent possesses action choice and is at least to some extent capable of deciding and

acting under self-control. Through its emphasis on autonomy, agent orientation signi?cantly di?ers from traditional engineering perspectives

such as structure orientation or object o-entation. These perspectives are targeted on the development of systems whose

behavior is fully determined and controlled by external units (e.g., by a p- grammer at design time and/or a user at run time), and thus inherently fail

to capture the notion of autonomy. This is a collection of published and unpublished essays by distinguished philosopher Michael E. Bratman of

Stanford University. They revolve around his influential theory, know as the "planning theory of intention and agency." Bratman's

primary concern is with what he calls "strong" forms of human agency --including forms of human agency that are the target of our talk about self

-determination, self-government, and autonomy. These essays are unified and cohesive in theme, and will be of interest to philosophers in ethics and

metaphysics. The NATO sponsored Advanced Study Institute 'The Biology and Tech nology of Intelligent Autonomous Agents' was an extraordinary

event. For two weeks it brought together the leading proponents of the new behavior oriented approach to Artificial Intelligence in

Castel Ivano near Trento. The goal of the meeting was to establish a solid scientific and technological foun dation for the field of intelligent autonomous

agents with a bias towards the new methodologies and techniques that have recently been developed in Ar tificial Intelligence under the

strong influence of biology. Major themes of the conference were: bottom-up AI research, artificial life, neural networks and techniques of

emergent functionality. The meeting was such an extraordinary event because it not only featured very high quality lectures on autonomous agents and the

various fields feeding it, but also robot laboratories which were set up by the MIT AI laboratory (with a lab led by Rodney Brooks) and the VUB AI laboratory

(with labs led by Tim Smithers and Luc Steels). This way the participants could also gain practical experience and discuss in concreto what the difficulties

and achievements were of different approaches. In fact, the meeting has been such a success that a follow up meeting is planned for

September 1995 in Monte Verita (Switzerland). This meeting is organised by Rolf Pfeifer (University of Zurich). Katherin A. Rogers presents a new

theory of free will, based on the thought of Anselm of Canterbury. We did not originally produce ourselves. Yet, according to Anselm, we can engage in

self-creation, freely and responsibly forming our characters by choosing 'from ourselves' (a se) between open options. Anselm introduces a new, agent-

causal libertarianism which is parsimonious in that, unlike other agent-causal theories, it does not appeal to any unique and mysterious

powers to explain how the free agent chooses. After setting out Anselm's original theory, Rogers defends and develops it by addressing a series of

standard problems levelled against libertarianism. These include the problem of 'internalism—in that an agent is not the source of his original

motivations, how can the structure of his choice ground his responsibility? ; the problem of Frankfurt-style countere xamples—Do we really need open options

to choose freely?; and the problem of luck—If nothing about an agent before he chooses explains his choice, then isn't the choice just

dumb luck? (The Anselmian answer to this perennial criticism is especially innovative, proposing that the critic has the relationship

between choices and character exactly backwards.) Finally, as a theory about self-creation, Anselmian Libertarianism must defend the tracing

thesis, the claim that an agent can be responsible for character-determined choices, if he, himself, formed his character through earlier a se

choices. Throughout, the book defends and exemplifies a new methodological suggestion: someone debating free will ought to make his

background world view explicit. In the on-going debate over the possibility of human freedom and responsibility, Anselmian Libertarianism constitutes a

new and plausible approach.

Free Will and Luck

Anselmian Libertarianism

Self-Governance and the Modern Subject

From Self-control to Autonomy The Robotics Primer

Intelligent agents are one of the most important developments in computer science of the

past decade. Agents are of interest in many important application areas, ranging from human-computer interaction to industrial process control. The ATAL

workshop series aims to bring together researchers interested in the core/micro aspects of agent technology. Speci?cally, ATAL addresses issues such as theories of

agency, software architectures for intelligent agents, methodologies and programming languages for r-lizing agents, and software tools for

applying and evaluating agent systems. One of the strengthsoft heATALworksho pseriesisitsemph asisonthesynergi esbetweentheori es, languages, architectures, infrastructures, methodologies,

and formal methods. This year s workshop continued the ATAL trend of attracting a large number of high quality submissions. In more detail, 71 papers were submitted to the

ATAL 2000 workshop, from 21 countries. After stringent reviewing, 22 papers were accepted for publication and appear in these proceedings. As with previous workshops in

the series, we chose to emphasize what we perceive asi mportantnewthe mesinagentrese arch. Thisyear st hemeswereboth associatedwith the fact that the technology of intelligent

agents and multi-agent systems is beginning to migrate from research labs to software engineering centers. As agents are deployed in applications such as

electronic commerce, and start to take over responsibilities for their human users, techniques for controlling their autonomy become crucial. As well, the

availability of tools that facilitate the design and implementation of agent systems becomes an important factor in how rapidly the technology will achieve

widespread use. The second edition of a comprehensive introduction to all aspects of mobile robotics, from algorithms to mechanisms. Mobile robots range from the Mars Pathfinder

mission's teleoperated Sojourner to the cleaning robots in the Paris Metro. This text offers students and other interested readers an introduction to the

fundamentals of mobile robotics, spanning the mechanical, motor, sensory, perceptual, and cognitive layers the field comprises. The text focuses on mobility itself, offering an

overview of the mechanisms that allow a mobile robot to move through a real world environment to perform its tasks, including locomotion, sensing, localization, and

motion planning. It synthesizes material from such fields as kinematics, control theory, signal analysis, computer vision, information theory, artificial intelligence, and probability

theory. The book presents the techniques and technology that enable mobility in a series of interacting modules. Each chapter treats a different aspect of mobility, as

the book moves from low-level to high-level details. It covers all aspects of mobile robotics, including software and hardware design considerations, related technologies,

and algorithmic techniques. This second edition has been revised and updated throughout, with 130 pages of new material on such topics as locomotion, perception,

localization, and planning and navigation. Problem sets have been added at the end of each chapter. Bringing together all aspects of mobile robotics

into one volume, Introduction to Autonomous Mobile Robots can serve as a textbook or a working tool for beginning practitioners. Curriculum developed by Dr. Robert King,

Colorado School of Mines, and Dr. James Conrad, University of North Carolina-Charlotte, to accompany the National Instruments LabVIEW Robotics Starter

Kit, are available. Included are 13 (6 by Dr. King and 7 by Dr. Conrad) laboratory exercises for using the LabVIEW Robotics Starter Kit to teach

mobile robotics concepts.

This book presents an ethical theory that uniquely integrates naturalistic and rationalistic elements. Robert Audi develops his

theory in four areas: moral epistemology, the metaphysics of ethics, moral psychology, and the foundations of ethics. Comprising both new and published work, the book sets

forth a moderate intuitionism, clarifies the relation between reason and motivation, constructs a theory of intrinsic value and its place in moral obligation,

and presents a sophisticated account of moral justification. The concluding chapter articulates a new normative framework built from both Kantian and intuitionist

elements. Connecting ethics in novel ways to both the theory of value and the philosophy of action, the essays explore topics such as ethical intuition, reason and

judgement, and virtue. Audi also considers major views in the history of ethics, including those of Aristotle, Hume, Kant, Mill, Moore, and W. D. Ross, and engages contemporary

work on autonomy, responsibility, objectivity, reasons, and other issues. Clear and conceptually rich, this book makes vital reading for students and

scholars of ethics. Challenging many of the currently accepted conceptions of autonomy and of how it is valued, Oshana develops a social-relational

account of autonomy that is constituted by a person's relations with others and by the absence of certain social relations. She denies that command over one's motives

and the freedom to realize one's will are sufficient to secure the kind of command over one's life that autonomy requires, and argues against psychological, procedural, and

content neutral accounts of autonomy.
Agents and Computational Autonomy
Autonomous Robots
From Biological Inspiration to Implementation and Control

A Theory of Personal Autonomy ECAI 2006