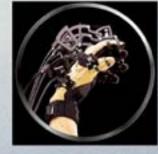
# **Biologically Inspired** Intelligent Robots







### Yoseph Bar-Cohen Cynthia Breazeal

#### OUTLINE

#### Chapter 1: Biomimetic Intelligent Robots - Introduction C. Breazeal, MIT; and Y. Bar-Cohen, JPL

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- 1.1.1 Historical precursors
- 1.1.2 Modern Perspectives
- 1.2 Nature as a Model for Inspiration
- 1.3 The Process of Biomimetic Design
- 1.4 Themes of Biomimetic Design
  - 1.4.1 Biomimetic Structures and Actuators
  - 1.4.2 Believable and Realistic Animation
  - 1.4.3 Human Augmented Technologies
  - 1.4.4 Technologically Enhanced Humans
  - 1.4.5 Biomimetic Robots
    - 1.4.5.1 Sensing, Actuation, and Power
    - 1.4.5.2 Low-Level Control and Behavior
    - 1.4.5.3 Cognitive Modeling
  - 1.4.6 Applications
- 1.5 Summary and Outlook
- 1.6 Acknowledgement
- 1.7 References

#### Chapter 2: Biological Inspiration For Muscle Like Actuators of Robots Kenneth Meijer, U. of Maastricht, Netherlands; Y. Bar-Cohen, JPL; and Robert Full, UC Berkeley

- 2.1 **BIOLOGICAL INSPIRATION**
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- 2.4 Electro Active Polymers as Artificial Muscles
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- 2.5.4 Controlling a multi-segment body with linear actuators
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#### Chapter 3: Biomimetic Animated Creatures Bruce Blumberg, MIT

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- 3.2 The Intentional Stance
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  - 3.4.5 Verbs, Adverbs and Pose-Graphs
- 3.5 Toward an Inner-life: low level intelligence for low-level animation
- 3.6 State of the Art: Hard Problems and Future Directions
- 3.8 Conclusions: It's the glance not the eyes
- 3.9 References

#### **Chapter 4: Haptic and Telepresence Robotics**

Allen Fisch, Rutger U.; Dinos Mavroidis, Rutgers U.; Yoseph Bar-Cohen, JPL; and Juan Melli-Huber Rutger University

- 4.1 INTRODUCTION
- 4.2 HAPTIC SYSTEMS
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    - 4.4.2.2 MEMICA Exoskeleton
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- 4.5 ACKNOWLEDGEMENTS
- 4.6 **REFERENCES**

## **Chapter 5: Cyborg Technology - Biomimetic Orthotic and Prosthetic Technology**

#### Hugh Herr, MIT; University Graham Paul Whiteley, U. of Bath, England; and Dudley Childress, Northwester University

- 5.1 Introduction
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#### **Chapter 6: Character Creation - Structural Elements of Biomimetic Robots** *Richard Landon, Stan Winston Studios*

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#### Gil Pratt, MIT

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#### Dan Paluska, MIT; Maja Mataric, USC; and Jerry Pratt, MIT

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  - 9.3.1 Bottom-Up Contribution: Feature Maps
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- 9.6 Models of Emotion: A View From Evolution
  - 9.6.1 Theory of Basic Emotions
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#### **Chapter 10: Bio-Robotic Applications**

David Hanson, UTD; Daniela Rus, Dartmouth University; Steven Canvin, Lego; and Gernot Schmierer, Schmalz GmbH, German;

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  - 10.5.1.1.3 Cyber Spider™
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  - 10.5.1.2.1 i-Cybie robotic dog
  - 10.5.1.2.2 Cat-like robot NeCoRo
  - 10.5.1.3 Humanoid Toys
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### Chapter 11: Outlook for the Technology of Intelligent Biomimetic Robots *Yoseph Bar-Cohen, JPL; and Cynthia Breazeal, MIT*

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