



Evolution Robotics, Inc.
Press Kit
October 2004

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Evolution Robotics Expands Line of Navigation Solutions For Robots and Intelligent Devices

NorthStar Localization Solution Adds Depth to Company's Navigation Product Line and Offers OEMs New Option for Robotic Consumer Products

Pasadena, Calif – October 5, 2004 – Evolution Robotics, a leading provider of next-generation robotics technologies and component solutions, today introduced NorthStar™, a new, low-cost, hardware and software localization solution that enables mobile devices to navigate more intelligently in indoor environments.

Similar to global positioning systems (GPS), the NorthStar system measures a device's exact coordinates and heading using harmless and invisible IR light spots projected onto the ceiling of its environment. By triangulation, the NorthStar system can instantly determine the device's exact position and heading with very high accuracy. Unlike GPS however, NorthStar works indoors, is more precise, and provides instantaneous and absolute course information.

NorthStar is the newest addition to the Evolution Robotics line of technologies which includes vSLAM™, a software and camera-sensor solution based on the company's visual pattern recognition technology (ViPR™). The NorthStar system brings advanced localization performance at costs suitable for the consumer products industry.

"Expanding our product portfolio with NorthStar provides our customers with the ability to add positional awareness to their products at costs manageable for low-margin, high-volume manufacturing," said Joe Brown, Vice President of Robotic Systems at Evolution Robotics. "Between NorthStar and vSLAM, manufacturers have the flexibility to choose which navigation solution best fits their needs. NorthStar further demonstrates Evolution Robotics' superior level of expertise in the field of robotic navigation and dedication to helping companies bring intelligent devices to market. We believe this product will not only bring a higher level of intelligence and functionality to autonomous mobile products like floor care robots, but will also enable the emergence of entirely new categories of position-aware products."

NorthStar is designed for incorporation into a wide variety of products. The detector is small, and the simple LED-based IR projector can be implemented in a wide range of designs supporting a product's particular look, feel, and function. NorthStar technology is also useful for industrial applications and can be applied to large-scale indoor environments such as department stores, factories and shopping malls.

"NorthStar provides a very elegant solution to an essential and longstanding problem of localization in robotics," said Paolo Pirjanian, Chief Scientist at Evolution Robotics. "This technology marks a major milestone for robotics in general and consumer products in particular."

We believe that the advent of this technology will spur the creation of new markets in robotics which were not possible before.”

NorthStar will be available for ordering in quantity by the end of this year. For more information please visit www.evolution.com.

About Evolution Robotics

Evolution Robotics™ (www.evolution.com) develops state-of-the-art robotics solutions, and partners with original equipment manufacturers to integrate those technologies into new and more intelligent products. The company’s product line includes software, hardware and component solutions centered around their core technologies in computer vision and autonomous navigation. Its ERSP™ software development platform provides core infrastructure, computer vision, navigation and path planning, and human-robot interaction modules. These can be licensed individually or as a Software Development Kit. The NorthStar™ system is a low-cost localization solution that enables electronic devices to navigate more accurately in indoor environments. The company also markets LaneHawk™ a loss-prevention solution for retailers that reduces inventory shrinkage by automatically ringing up under-cart items. With its award-winning team of engineers, Evolution Robotics offers expertise and guidance to help its partners produce better products at competitive prices. Its mission is to accelerate the creation of a variety of highly functional robotics products across a broad range of industries. Evolution Robotics is an operating company of Idealab, a creator and operator of technology businesses.

NorthStar™ is a technological breakthrough that signifies world-leading advances in localization performance and cost. NorthStar is a photonic technology that enables any electronic product to know exactly where it is in its environment in real time. It is now possible to deliver consumer products with the ability to return to a recharging station from anywhere in the environment, to automatically perform or not perform particular functions based on location, or to systematically patrol with high precision. NorthStar breaks the barrier to this level of intelligence with high reliability and low cost.

What is NorthStar

NorthStar is a localization system comprised of two components:

- **NorthStar Detector**
embedded in a product
- **NorthStar IR Projector**
in the environment where the product will be

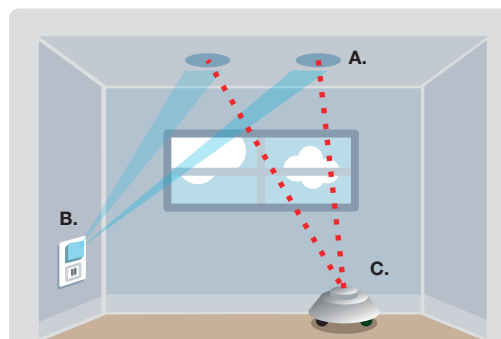
(A projector can be designed to be compact and unique, to compliment your product design.)



The NorthStar Detector



Example of NorthStar IR Projector



- A. Invisible light spots
- B. NorthStar IR Projector in environment
- C. NorthStar Detector on product

Application Examples

- Reliable and direct-return to a charging station
- Tracking of assets, people, etc.
- Systematic navigation in multi-room environments
- Fast and accurate mapping of the environment
- Instantaneous recovery from "robot kidnapping"
- Context-sensitive appliances

How It Works

The NorthStar detector uses triangulation to measure a product's exact position and heading in relation to IR light spots projected onto the ceiling (or any visible surface). Because each IR light spot has a unique signature, the detector can instantly and unambiguously determine where the product is.

Because the NorthStar detector directly measures a product's position and heading, the localization result is intrinsically robust. A NorthStar-enabled product does not require prior training or mapping to measure its position. There is no need for expensive computational capabilities. The system is insensitive to changes in the environment such as moving furniture or people and works in complete darkness.

Ease of Integration

The NorthStar system is simple to integrate into any product. The detector is small, uses a simple electronic interface and communications protocol. All signal conditioning and geometrical calculations are performed by the detector. The IR projectors use low-cost LEDs, and can be small and unobtrusive. They can be designed to plug into an outlet like an air freshener, built into a re-charging station or can stand alone on a bookshelf.

The NorthStar system can also be applied to large-scale, indoor environments such as large department stores, factories and shopping malls. In larger environments like these, it is possible to use more projectors or a grid of LED beacons depending on the specifics of the application.

Product Details (Detector)

Basic Specifications *

- Dimensions: 1.2" x 1.6" x 0.4" [3cm x 4cm x 1cm]
- Weight: .9oz [25g]
- Power: 3.3 VDC, 200mA
- Communications: Serial in and out, 19200-115200 baud, 5V tolerant interface
- Ambient Lighting Conditions:
 - a. Maximum ambient light, point source: 600 LUX
 - b. Maximum ambient light, diffuse conditions: 2500 LUX
- Field of View: 120°
- Single Measurement Time: 100 msec
- Maximum number of unique room codes: 10
- Maximum number of simultaneous spots: 20

Accuracy of Localization

Under these conditions:

- Spot Position: Near room center
- Spot Intensity: 120mW (4 LED's per spot)
- Ceiling Height: 8ft [2.4m]
- Detector distance from room center: 10ft [3m]
- Ceiling Surface: Flat, white

Accuracy is (1 standard deviation, single measurements):

- Position: 5cm – 15cm
- Heading: 3°

NOTE: Accuracy is based on non-systematic errors from random measurement noise, assuming systematic errors have been removed by calibration.

The accuracy of a single measurement varies with ceiling height, detector distance to room center, spot position relative to the room center, spot intensity and the light scattering properties of the ceiling.

Target Environment

- Floor area covered by 1 pair of spots with an 8ft ceiling: 20ft X 20ft [6m X 6m]
- Maximum ceiling height: 20ft [6m]
- Ceiling flatness: Ceilings can be irregular or slanted
- Maximum radial position to detect room ID: 18ft [5.5m]

Although the NorthStar system is designed to function in the environment described above, operation outside these ranges is also possible. Contact us for further details.

** Numbers are approximate; consult latest specification documentation for exact information. Latest product specifications may differ.*

Contact Us

Please contact us for a demonstration, more product details, or purchasing information.

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Powering Intelligent Products



Corporate Profile

Evolution Robotics, Inc. (www.evolution.com) develops state-of-the-art robotics solutions, and partners with original equipment manufacturers to integrate those technologies into new and more intelligent products. Whether used within autonomous robots for commercial or consumer use, or electronic devices with increased, intelligent functionality, Evolution Robotics provides the technologies and services to bring those products to life, and to market.

The company's flagship product - **ERSP™** - is a software development platform designed to provide core infrastructure for robotic application development projects. This core infrastructure along with key robotic functionality including computer vision, navigation and path planning, and human-robot interaction, enables companies to focus on creative product development using state-of-the-art tools.

Evolution Robotics develops superior visual pattern recognition and autonomous navigation technologies that can be easily integrated into robotic and intelligent devices.

The company's ViPR™ technology (visual pattern recognition) is exceptional for its robust and reliable capabilities while working with very low-cost cameras like those found in standard web cams and the latest cell phones. Evolution Robotics ViPR technology can be used to produce a broad range of functional and marketable consumer products.

In addition, Evolution Robotics offers two technologies that give products the ability to be autonomous in unstructured, dynamic environments.

- vSLAM™ - the first-ever simultaneous localization and mapping technology that provides true, robust navigation with a software and single-sensor solution. vSLAM, can be used in large or small environments, indoors and out, and is based on the company's ViPR technology.
- NorthStar™ - a low-cost, indoor localization solution that combines a small sensor, processor and IR projector, providing accurate location information in real-time.

Evolution Robotics products and services are used by over 65 organizations and companies worldwide. Many of today's top research institutions and universities also utilize the company's technologies for their own R&D efforts, as well as for instructional use, including Caltech, MIT, Carnegie-Mellon, University of Tokyo and University of Hong Kong.

Evolution Robotics works closely with OEMs to identify compelling product ideas and bring them to life. Sony Corporation's Entertainment Robot Company was the first to integrate Evolution Robotics' ViPR technology into a commercial product – the Sony AIBO robotic dog. Evolution Robotics collaborated with Sony engineers to optimize the performance of the technology to run on a very low-cost processor.

Through a broad range of consulting, engineering services and training, Evolution Robotics helps its partners produce better products, reduce risk and improve competitiveness. The company offers expertise, resources, and system design guidance, and is dedicated to customizing its technologies to accommodate various development platforms. Evolution Robotics blends the best minds from the scientific community, and consumer electronics and software design firms to provide valuable insights and ideas on how to implement breakthrough technologies today. From product conceptualization and spec development to prototypes, the team transforms functionality into capability to deliver well-designed and robust products.

The two latest additions to the Evolution Robotics product line are LaneHawk™ and NorthStar™.

LaneHawk is a solution for reducing inventory shrink at retail outlets. The product automatically rings-up items in the bottom of shopping carts that are often overlooked or missed in the checkout process. By adding robotics functionality to the POS system and checkout lane, Evolution Robotics is able to turn an operational cost center into a revenue generator.

NorthStar is the latest addition to a line of technologies from Evolution Robotics that gives products the ability to intelligently navigate in an environment with purpose, instead of randomly as most of today's autonomous products do. For example, a robotic vacuum using NorthStar can be told to go to an exact location to clean and when finished, return to a base-station.

Evolution Robotics technologies, coupled with their extensive range of professional services and engineering talent, is poised to be a leading player in the emerging field of consumer service robotics. **Its Chief Scientist Dr. Paolo Pirjanian, was recently awarded the IEEE Robotics and Automation Award for early-career contributions to the field.**

With offices headquartered in the US and regional offices in Düsseldorf and Toyko, the company has grown substantially since its launch in February 2002. Evolution Robotics continues to invest in R&D as well as professional services, to produce new breakthroughs in technology, and amazing products with customers. The company has over two-dozen pending patents filed.

Evolution Robotics is an operating company of Idealab, a privately-held creator and operator of technology businesses.



Fact Sheet

- Company:** Evolution Robotics, Inc. develops state-of-the-art robotics technologies and partners with companies to integrate them into new and more intelligent products. OEMs capitalize on the company's advanced autonomous navigation and vision systems, including unmatched visual pattern recognition capabilities to design and market superior, low-cost robots and intelligent devices. Evolution Robotics is an operating company of Idealab, a creator and operator of technology businesses.
- Mission:** To accelerate the creation of a variety of highly functional robots and intelligent devices across a broad range of industries.
- Primary Products:**
- ERSP™:** a development platform including a robotics software architecture, core robotics functionality modules, and application development tools, all with powerful, breakthrough technologies for vision and navigation. ERSP is sold as a software development kit for Linux or Windows.
 - LaneHawk™:** a loss prevention solution for retailers enabling them to automatically ring-up items in the bottom of shopping carts.
 - NorthStar™:** a low-cost, indoor autonomous navigation system that provides extremely accurate localization information to mobile devices.
 - ViPR™:** algorithms that enable highly accurate and reliable visual pattern recognition with low-cost cameras such as those found in cell phones and web cams.
- Professional Services:** Developing a product with robotic functionality is a complex process – more complex than a most of today's electronics products. Evolution Robotics Professional Services enables companies to reduce the risk and time to market for the intelligent products they want to create. Services include training, system consulting and design, hardware and software integration, platform customization, application design and development. These services are all matched with expert project management skills. Evolution Robotics strives to build partnerships with each customer engagement, enabling more open communication and teamwork.
- Primary Markets Served:** Retail, Consumer Service Robotics, Military and Universities
- Customers:** Evolution Robotics' solutions are currently used by robotics researchers at top universities as well as globally recognized manufacturers around the world including The Sharper Image, SONY and Bandai.
- Executive Team:**
- Bill Gross, Executive Chairman
 - Alec Hudnut, President
 - Dr. Paolo Pirjanian, Chief Scientist
- Headquarters:**
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Established: March 2001, launched February 2002.



Executive Bios

Bill Gross is Executive Chairman of Evolution Robotics. As Founder, Chairman, and CEO of Idealab since 1996, Bill has launched a number of successful companies, including GNP Development (acquired by Lotus), Knowledge Adventure (acquired by Havas Vivendi) and Overture (acquired by Yahoo!). A well-known visionary and entrepreneur, Bill sits on the Board of Directors of Overture Services (NNM: OVER) and the Board of Trustees of the California Institute of Technology.

Alec Hudnut is President. Before joining Evolution Robotics, Alec was a Managing Director at Idealab, where he launched and supported a number of the organization's operating companies. Alec brings business, consulting, and corporate finance experience from previous roles as CEO and co-founder of Quisic (an online learning company), a consultant at McKinsey & Co., and an investment banker at Goldman Sachs & Co. Alec holds an M.B.A. from Harvard Business School.

Dr. Stephen Chiang is Vice President, Corporate Counsel at Evolution Robotics. Stephen brings with him over ten years of technical and project management experience including an established law career focusing on patent, copyright and IP licensing development. He has worked as an Engineering Specialist, Leader of Technology Group and Manager of Technology & New Business Development at Northrop-Grumman. In addition, Stephen's background in law combined with his engineering expertise has led to strategic corporate and legal positions including serving as the Director of Patent Licensing at the Boeing Company. There his responsibilities included managing corporate patent portfolio, directing domestic & foreign filing strategies and formulating IP coverage strategy for major corporate initiatives. Stephen holds a masters and PhD in engineering from the University of Wisconsin as well as an MBA in finance and JD from Columbia University. Stephen is a member of the State Bar of California, U.S. District Court, Central District and U.S. Patent and Trademark Office.

Dr. Paolo Pirjanian is Chief Scientist and a leading roboticist who has garnered unique expertise in developing state-of-the-art robotics systems. Until recently, he was a lead engineer at the Jet Propulsion Laboratory, working on robotics technologies for space exploration. Results of his work have been featured on CNN TV, CNN.com, NASA TV, and other media. Paolo is also a part-time faculty member in the Computer Science department of the University of Southern California, where he teaches graduate-level artificial intelligence. He holds a Ph.D. from Aalborg University in Denmark.

Joe Brown is Vice President of Robotic Systems. Joe has managed new technology development and product development, bringing numerous high technology products to market in diverse fields, including rapid prototyping, color ink jet, outdoor advertising, and fitness equipment. Additionally, Joe holds several patents, and has extensive experience in multidisciplinary systems development. Joe holds an M.S. in Engineering Sciences from the University of Colorado, Boulder, and a B.S. in Aerospace Engineering from St. Louis University.

Dr. Mario Munich, Vice President, Software and Sr. Research Scientist, is among the leading experts in speech recognition, computational vision, and learning systems. He has developed voice-activated

Internet browsing systems and has authored several academic publications and filed three U.S. patents. He received Ph.D. and M.S. degrees in Electrical Engineering from the California Institute of Technology.

Jennifer McNally is Vice President of Marketing, and brings with her over 15 years of experience marketing software and hardware products to customer segments including educators, consumers, enterprises and small businesses. Most recently Jennifer was Sr. Director of Corporate Marketing for eMachines/Free PC where she developed the Free PC brand through the roll-out of the first wave of PCs to consumers, and then after the eMachines acquisition of Free PC, led the project to re-brand eMachines to help open new sales channels. Previous to that Jennifer managed the direct response activities for Macromedia and product line marketing management for the company's flagship product line, Macromedia Director. She also held key sales and marketing roles at Claris/FileMaker for over 6 years. Jennifer holds a Bachelor of Arts degree in Political Science with a minor in Sociology, from UC Santa Barbara.

Yutaka Yamamoto is General Manager, Asia, and brings with him more than 15 years of strategic and hands-on high-technology business and product development experience. Most recently, Yutaka was President of PlanetWeb Japan where he built a business from the ground up and developed a great foundation in the Japanese appliance industry making a significant contribution to total revenues for the company. Prior to that, he held various positions with Sega including Director of New Technology and Manager of Hardware R&D. While at Sega, Yutaka managed the Sega Saturn Net Link project. He has also held key engineering positions at IBM working on the ThinkPad line and display technologies. Mr. Yamamoto holds a Bachelor of Science degree in Electrical Engineering from Tokyo University.

Hans-Guenther Brosius is Vice President and General Manager for EMEA at Evolution Robotics. Hans-Guenther has over 20 years of experience in the IT- Industry with in-depth background in large-scale enterprise, consulting and partner management. Previously, Hans-Guenther was with Symantec for 5 years, where he held numerous management positions in software sales and marketing. He served as the General Manager of sales, marketing and professional services, Symantec Central Europe. Prior to that, he was General Manager and a founding member of several companies, focused on IT and consulting for business clients. Hans-Guenther holds a degree in Information Technology from the University (FH) Dortmund in Germany.

Maynard Holliday is Director of Business Development for the Government and University sectors. He has worked as a senior engineering and robotics professional in government and the private sector for the last 20 years. Maynard has worked at Lawrence Livermore National Laboratory and in the semiconductor industry in Silicon Valley. He assembled and led the joint Department of Energy, NASA international Pioneer Project Team that designed and fabricated a radiation hardened telerobotic mobile vehicle for site characterization and remediation tasks at Chernobyl unit 4. He was awarded the American Association for the Advancement of Sciences., Science Engineering and Diplomacy Fellowship bringing him to Washington DC to work in technology policy at the U.S. State Department and at DOE Headquarters. Maynard holds a Master of Science degree in Mechanical Engineering Design from Stanford University and a Bachelor of Science degree in Mechanical Engineering from Carnegie Mellon University.

Michael McWilliams is Director of Business Development at Evolution Robotics and brings with him over 15 years experience in building and leading cutting edge technology businesses. Prior to joining Evolution, Michael was Executive Vice President at Royal-Utobia Group, a World Top 20 manufacturer, where he spearheaded their expansion into Asia and grew his divisions revenue in excess of \$300 million. He also spent 6 years as Vice President of Worldwide Business Development at publicly traded TNC, Inc., in Taipei where he was in charge of worldwide business development and co-developed the worlds first PC camera solution. Michael holds a bachelor's degree in business from USC.



Key Engineering Staff

The Evolution Robotics engineering team includes experts in robotics architectures, vision, speech recognition, human-robot interface, navigation, and consumer and industrial products. The team has been recruited from both leading universities and industry.

Key Team Members Include:

Dr. Paolo Pirjanian is Chief Scientist and a leading roboticist who has garnered unique expertise in developing state-of-the-art robotics systems. He was a lead engineer at the Jet Propulsion Laboratory working on robotics technologies for space exploration and is currently a part-time faculty member at the Computer Science department of the University of Southern California. He holds a Ph.D. from Aalborg University in Denmark.

Dr. Mario Munich, Vice President, Software and Sr. Research Scientist, is among the leading experts in speech recognition, computational vision, and learning systems. He has developed voice-activated Internet browsing systems and has authored several academic publications and filed three U.S. patents. He received Ph.D. and M.S. degrees in Electrical Engineering from the California Institute of Technology.

Joe Brown, Vice President of Robotic Systems, has managed new technology development and product development, bringing numerous high technology products to market in diverse fields, including rapid prototyping, color ink jet, outdoor advertising, and fitness equipment. Additionally, Joe holds several patents, and has extensive experience in multidisciplinary systems development. Joe holds an M.S. in Engineering Sciences from the University of Colorado, Boulder, and a B.S. in Aerospace Engineering from St. Louis University.

Dr. Enrico Di Bernardo, Sr. Research Scientist and Project Lead, is a member of the R&D team focusing on computational vision and robotic systems. His past work experiences include a Postdoctoral Scholar in the Division of Applied Sciences of the California Institute of Technology, co-founder of a software start-up, and head of the R&D group at Idealab, a technology incubator. His scientific interests are in the areas of computational vision, robotics, and human-machine interfaces. He received a PhD in Systems Engineering from the University of Padova, Italy.

Dr. Luis Goncalves, Senior Scientist, develops technology for vision-based navigation, object recognition, and machine-human interaction, that enable low-cost commercial robotic products. His research interests are in computer vision and machine learning, especially as applied to robotics. He received a B.A.Sc. in Electrical Engineering from the University of Waterloo, Canada, in 1991. In 1992 he received an M.S. in Electrical engineering, and in 2000 a Ph.D. degree in Computation and Neural Systems, both from the California Institute of Technology, Pasadena.

Dr. Jim Ostrowski is Senior Research Scientist with expertise in mobile robotics, nonlinear dynamics, and vision-based control. Jim is currently on leave from the University of Pennsylvania, where he is an Associate Professor in the Department of Mechanical Engineering and a member of the General Robotics, Sensing, Automation, and Perception (GRASP) Laboratory. He holds a

Ph.D. in Mechanical Engineering from the California Institute of Technology, and he is currently an Associate Editor for the journal *IEEE Transactions on Robotics and Automation*.

Dr. Niklas Karlsson is the Senior Scientist in navigation and control systems and specifically responsible for SLAM (simultaneous localization and mapping) research. Niklas is an expert in feedback control and navigation technologies. He holds eight pending patents in the area of navigation and has published several academic papers on nonlinear control and navigation related topics. He received a Ph.D. in Mechanical Engineering, specializing in Control, Dynamic Systems, and Robotics, and an M.A. in Statistics, from the University of California, Santa Barbara. He also received an M.S. in Engineering Physics from Lund University, Sweden.



Advisory Board

Dr. Ron Arkin is the Director of the Mobile Robot Laboratory and a professor in the College of Computing at the Georgia Institute of Technology. His research interests include behavior-based reactive control and action-oriented perception for mobile robots and unmanned aerial vehicles, hybrid deliberative/reactive software architectures, multi-agent robotic systems, human-robot interaction, and learning in autonomous systems. He has over 110 technical publications in these areas, and he wrote *Behavior-Based Robotics* and co-edited *Robot Colonies*. Ron served consecutive three-year terms on the Administrative Committee of the IEEE Robotics and Automation Society, and he serves on the National Science Foundation's Robotics Council. Ron is a Senior Member of the IEEE and a member of AAI and ACM. He received a B.S. from the University of Michigan, an M.S. from the Stevens Institute of Technology, and a Ph.D. in computer science from the University of Massachusetts, Amherst.

Dr. George Bekey is the Gordon Marshall Professor of computer science, electrical engineering, and biomedical engineering at the University of Southern California, where he founded the biomedical engineering department and the Robotics Research Laboratory. He has published over 200 papers, is the editor-in-chief of the journal *Autonomous Robots*, and was the founding editor of *IEEE Transactions on Robotics and Automation*. A member of the National Academy of Engineering, George has also worked in the industry as an engineer with Beckman Instruments and TRW Systems. George received a Ph.D. from the University of California, Los Angeles.

Dr. Joel Burdick is a professor of mechanical engineering at the California Institute of Technology and is also the Deputy Director of the Center for Neuromorphic Systems Engineering. He is the director of the Robotics Group, where his research interests lie in the areas of kinematics and mechanical systems. His current research initiatives include robotic locomotion, sensor-based robot motion planning, multi-fingered robotic hand manipulation, medical applications of robotics, applied nonlinear control theory, and neural prosthetics. He received an NSF Presidential Young Investigator award, the Office of Naval Research Young Investigator award, and a Feynman Fellowship. Joel received an undergraduate degree from Duke University and M.S. and Ph.D. degrees in mechanical engineering from Stanford University.

Dr. Henrik Christensen is the Director of the Center for Autonomous Systems and a professor of computer science at Sweden's Royal Institute of Technology. Henrik has published more than 120 papers in the fields of computer vision and robotics, has co-edited five books, has consulted for numerous companies on the development of real-time autonomous systems, and is an associate editor of *AI Magazine* as well as five international journals. Henrik is also an advisor to the European Union's Future and Emerging Technology Office and to the Swedish Foundation for International Cooperation in Research and Higher Education. Henrik received M.Sc. and Ph.D. degrees from Aalborg University in Denmark.

Dr. Maja Mataric is an associate professor of computer science at the University of Southern California, where she is also the Director of the USC Robotics Research Laboratories, an Associate Director of the Institute of Robotics and Intelligent Systems, and an associate editor of three peer-reviewed journals. Her current research interests include modeling, behavior-based control, and learning in distributed robot systems. Maja received a Ph.D. from the Massachusetts Institute of Technology.

Dr. Don Norman is the co-founder of the Nielsen Norman Group, an executive consulting firm that helps companies produce human-centered products and services, where he specializes in consumer products. In this role, he serves as advisor and board member to numerous companies. *Newsweek* has called him “the guru of workable technology.” Don is Professor Emeritus of both cognitive science and psychology at the University of California, San Diego. Previously, he was Vice President of the Advanced Technology Group at Apple Computer and an executive at Hewlett-Packard.

Dr. Pietro Perona is a professor of electrical engineering at the California Institute of Technology, where he is the director of the Caltech Vision Group and the Center for Neuromorphic Systems Engineering. His research focuses on computational aspects of vision, including early vision, autonomous navigation, shape reconstruction, and visual pattern recognition. He is also a co-founder of Digital Persona, a leading manufacturer of consumer biometric devices and services. Pietro received a D.Eng. from the University of Padova in Italy and a Ph.D. from the University of California, Berkeley.

Dr. David Lowe is a Professor of Computer Science at the University of British Columbia. His research has developed new approaches to visual object recognition, invariant image features, pose determination, visual indexing, and robot localization. He received his Ph.D. in computer science from Stanford University in 1984. From 1984 to 1987 he was an assistant professor at the Courant Institute of Mathematical Sciences at New York University. He was a Scholar of the Canadian Institute for Advanced Research from 1987 to 1995. He serves on the editorial boards of the *International Journal of Computer Vision and Foundations* and *Trends in Computer Graphics and Vision*.