

## Curriculum Vitae

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AFFILIATION: Department Chairman, Department of Interdisciplinary Information Studies  
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### EDUCATION:

March 1973 Graduated from Department of Mechanical Engineering, Kyoto University  
March 1975 Received M. Eng. degree in Information Engineering, the University of Tokyo.  
March 1978 Received Ph.D. degree in Information Engineering from The University of Tokyo

### WORK EXPERIENCE:

September 1978 to March 1980  
Research Associate, Artificial Intelligence Lab, MIT  
April 1980 to September 1983  
Research Member, Electrotechnical Lab., Japanese Government  
September 1982 to September 1983  
Research Scientist, the Artificial Intelligence Lab, MIT  
October 1983 to March 1986  
Senior Research Member, Electrotechnical Lab., Japanese Government  
April 1986 to June 1987  
Visiting Research Scientist, Computer Science, Carnegie Mellon University  
July 1987 to June 1993  
Senior Research Scientist, Computer Science, Carnegie Mellon University  
July 1993 to March 1996  
Principal Research Scientist, Computer Science, Carnegie Mellon University  
April 1996 to present  
Professor, Institute of Industrial Science, the University of Tokyo  
April 1996 – present  
Professor, Department of Electrical Engineering, the University of Tokyo  
April 1997 to present  
Professor, Dept of Information Science, the University of Tokyo

April 1997 to March 2001, April 2005 to present

Professor, Center for Spatial Information Science, The University of Tokyo

April 2000 to present

Professor, Graduate school of Interdisciplinary Information Studies, The University of Tokyo

April 2006 to present

Professor, National Institute of Informatics

April 2006 to present

Department Chairman, Department of Interdisciplinary Information Studies, The University of Tokyo

## PUBLICATIONS:

### **JOURNALS (English)**

J. Takamatsu, T. Morita, K. Ogawara, H. Kimura, and K. Ikeuchi (2006): "Representation for Knot-Tying Task," IEEE Trans. on Robotics, 22 1, pp.65-78, February.

K. Hara, K. Nishino, and K. Ikeuchi (2005): "Light Source Position and Reflectance Estimation from a Single View without The Distance Illumination Assumption," IEEE Trans. on Pattern Analysis and Machine Intelligence(PAMI), Vol.27 No.4, pp.1-13, April.

J. Takamatsu, Y. Uehara, T. Masuda, A. Nakazawa, K. Ikeuchi, A. Okabe, Y. Hayashi, Y. Ino, T. Oka, K. Nomura, T. Amano, and H.I.H. Akishinomiya Fumihito, (2005): "A Novel Osteometrical Method Using Computer Vision Techniques for Comparison of Morphological Differences," Journal Yamashina Inst Ornithol, Vol. 36, No. 2, March.

R. Sagawa, K. Nishino, and Katsushi Ikeuchi (2005): "Adaptively Merging Large-Scaale Range Data with Reflectance Properties," IEEE Trans. on Pattern Analysis and Machine Intelligence(PAMI), Vol. 27 No. 3, pp.392-405, March.

K. Bernardin, K. Ogawara, K. Ikeuchi, R. Dillmann, (2005): "A Sensor Fusion Approach for Recognizing Continuous Human Grasping Sequences Using Hidden Markov Models," IEEE Trans.s on Robotics and Automation, Vol. 21, No.1, pp.47-57, February.

Shintaro Ono and Katsushi Ikeuchi (2004): "Self-Position Estimation for Virtual 3D City Model Construction with the Use of Horizontal Line Laser Scanning," International Journal of ITS Research, 2, pp.67-75, October.

R. T. Tan, K. Nishino, and Katsushi Ikeuchi (2004): "Separating Reflection Components Based on Chromaticity and Noise Analysis," IEEE Trans. on Pattern Analysis and Machine Intelligence(PAMI), Vol. 26 No. 10, pp.1378-1379, October.

- Y. Matsushita, K. Nishino, K. Ikeuchi, and Masao Sakauchi (2004): "Illumination Normalization with Time-dependent Intrinsic Images for Video Surveillance," *IEEE Trans. on Pattern Analysis and Machine Intelligence(PAMI)*, Vol. 25, No. 10, pp. 1336-1347, October.
- K. Ikeuchi, M. Sakauchi, H. Kawasaki, S. Ono (2004): "Constructing Virtual cities by Using Panoramic Images," *International Journal of Computer Vision*, Vol. 58 No.3, pp. 237-247, July.
- A. Banno, T. Masuda, and K. Ikeuchi (2004): "Three dimensional visualization and comparison of impressions on fired bullets," *Forensic Science International*, Vol.140 No.2-3, pp.233-240, March.
- R. T. Tan, K. Nishino, and K. Ikeuchi (2004): "Color constancy through inverse-intensity chromaticity space," *Journal of Optical Society of America*, Vol.21 No.302, March.
- R. T. Tan, K. Nishino, and K. Ikeuchi (2004): "Separating Reflection Components Based on Chromaticity and Noise Analysis," *IEEE Trans. on Pattern Analysis and Machine Intelligence(PAMI)*, Vol. 26 No. 10, pp.1373-1379, January.
- D. Miyazaki, M. Kagesawa, and K. Ikeuchi (2004): "Transparent Surface Modeling from a Pair of Polarization Images," *IEEE Trans. on Pattern Analysis and Machine Intelligence(PAMI)*, Vol.26 No.1, pp.73-82, January.
- T. Masuda, S. Imazu, S. Auethavekiat, T. Furuya, K. Kawakami, and K. Ikeuchi (2003): "Shape difference visualization for ancient bronze mirrors through 3D range images," *The Journal of Visualization and Computer Animation*, pp.183-196, October.
- K. Ogawara, J. Takamatsu, H. Kimura, K. Ikeuchi (2003): "Extraction of Essential Interactions Through Multiple Observations of Human Demonstrations," *IEEE Trans. on Industrial Electronics*, vol. 50 No. 4, pp.667-675, August.
- I. Sato, Y. Sato, and K. Ikeuchi (2003): "Illumination from shadows," *IEEE Trans. on Pattern Analysis and Machine Intelligence(PAMI)*, Vol. 25 No. 3, pp. 290-300, March
- K. Ogawara, J. Takamatsu, H. Kimura, K. Ikeuchi (2003): "Acquisition of A Symbolic Manipulation Task Model by Attention Point Analysis," *Advanced Robotics*, vol. 17 No. 10, pp.1073-1091, October.
- T. Yoshida, S. Mohottala, M. Kagesawa, K. Ikeuchi (2002): "Vehicle Classification System with Local-Feature Based Algorithm Using CG Model Images," *IEICE Trans. on ED*, Vol.E85-D No.11, pp.1745-1752, November.

K. Nishino, Y. Sato, K. Ikeuchi (2001): "Eigen-Texture Method: Appearance Compression and Synthesis Based on a 3D Model," IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI), Vol.23 No.11, pp.1257-1265, November.

M. Kagesawa, S. Ueno, K. Ikeuchi, H. Kashiwagi (2001): "Recognizing Vehicles in Infra-red Images Using IMAP Parallel Vision Board," IEEE Trans. on Intelligent Transportation Systems, Vol. 2 No. 1, March.

S. Kamijo, Y. Matsushita, K. Ikeuchi, and M. Sakauchi (2000): "Traffic Monitoring and Accident Detection at Intersections," IEEE Trans. on Intelligent Transportation Systems, Vol.1 No.2, pp. 108-118, June.

M. Saito, Y. Sato, K. Ikeuchi and H. Kashiwagi (1999): "Measurement of surface orientations of transparent object using polarization in highlight," Journal of Optical Society of America A, Vol. 16 No. 9, pp. 2286-2293, September.

I. Sato, Y. Sato, and K. Ikeuchi (1999): "Acquiring a radiance distribution to superimpose virtual objects onto a real scene," IEEE Trans.. Visualization and Computer Graphics, Vol. 5 No. 1, pp. 1-12, January.

K. Ohba and K. Ikeuchi (1998): "Stable Recognition of the Specularity Objects with Eigen-Window," Systems and Computers in Japan, Vol.29 No.7, pp.12-20, July.

J. Miura and K. Ikeuchi (1998): "Task Planning of Assembly of Flexible Objects and Vision-based Verification," Robotica, Vol. 16, pp.297-307

Y. Sato, I. Sato, and K. Ikeuchi (1998): "3D Shape and Reflectance Morphing," Systems and Computers in Japan, Vol. 29 No. 3, pp. 28-38, March.

J. Miura and K. Ikeuchi (1998): "Task-Oriented Generation of Visual Sensing Strategies in Assembly Tasks," IEEE Trans. on Pattern Analysis and Machine Intelligence(PAMI), Vol. 20 No. 2, pp.126—138, February.

H. Y. Shum, M. Hebert, K. Ikeuchi, and R. Reddy (1997): "An Integral Approach to Free-Form Object Modeling," IEEE Trans. Pattern Analysis and Machine Intelligence, Vol. 19, No. 12, pp. 1366-1370, December.

K. Ohba and K. Ikeuchi (1997): "Detectability, Uniqueness, and Reliability of Eigen Windows for Stable Verification of Partially Occluded Objects," IEEE Trans. Pattern Analysis and Machine Intelligence, Vol. 19, No. 9, pp. 1043-1048, September.

K. Ohba and K. Ikeuchi (1997): "Visual Learning System for the Stable 3D Object Recognition," Trans. of the Institute of Electronics, Information and Communication Engineers, Vol.117-C No.5, pp.528-533, May.

S. B. Kang and K. Ikeuchi (1997): "Toward Automatic Robot Instruction from Perception -- Mapping Human Grasps to Manipulator Grasps," IEEE Trans. Robotics and Automation, Vol. 13, No. 1, pp. 81-95, February.

Y. Sato, I. Sato and K. Ikeuchi (1997): "Object Shape Morphing with Intermediate Reflectance Properties," International Journal of Shape Modeling, Vol. 3 No. 1&2, pp. 91-106, January.

Y. Sato and K. Ikeuchi (1996): "Reflectance Analysis for 3D Computer Graphics Model Generation," Graphical Models and Image Processing, Vol. 58 No.5, pp. 437-451, September.

F. Solomon and K. Ikeuchi (1996): "Extracting the Shape and Roughness of Specular Lobe Objects using Four Light Photometric Stereo," IEEE Trans. Pattern Analysis and Machine Intelligence, Vol. 18, No. 4, pp.449-454, April.

M. D. Wheeler and K. Ikeuchi (1996): "Iterative Smoothed Residuals: A Low-Pass Filter for Smoothing with Controlled Shrinkage," IEEE Trans. Pattern Analysis and Machine Intelligence, Vol. 18, No. 3, pp.334-337, March.

S. B. Kang and K. Ikeuchi (1995): "Toward Automatic Robot Instruction from Perception -- Temporal Segmentation of Tasks from Human Hand Motion," IEEE Trans. Robotics and Automation, Vol. 11, No. 5, pp. 670-681, October.

H. Y. Shum, K. Ikeuchi, and R. Reddy (1995): "Principal Component Analysis with Missing Data and Its Application to Polyhedral Object Modeling," IEEE Trans. Pattern Analysis and Machine Intelligence, Vol.17, No. 9, pp. 854-867, September.

K. Higuchi, M. Hebert, and K. Ikeuchi (1995): "Building 3-D Models from Unregistered Range Images," Graphical Models and Image Processing, Vol. 57, No. 4, pp.315-333, July.

M. Hebert, K. Ikeuchi, and H. Delingette (1995): "A Spherical Representation for Recognition of Free-Form Surfaces," IEEE Trans. Pattern Analysis and Machine Intelligence, Vol. 17, No. 7, pp. 681-690, July.

M. D. Wheeler and K. Ikeuchi (1995): "Sensor Modeling, Probabilistic Hypothesis Generation, and Robust Localization for Object Recognition", IEEE Trans. Pattern Analysis and Machine Intelligence, Vol. 17, No. 3, pp. 252-265, March.

Y. Sato and K. Ikeuchi (1994): "Temporal-color Space Analysis of Reflection", Journal of Optical Society of America A, Vol. 11, No. 11, pp.2990-3002, November.

K. Ikeuchi and T. Suehiro (1994): "Toward an Assembly Plan from Observation, Part I: Task Recognition with Polyhedral Objects", IEEE Trans. Robotics and Automation, Vol. 10, No. 3, pp. 368-385, June.

K. D. Gremban and K. Ikeuchi (1994): "Planning Multiple Observations for Object Recognition", Intern. Journal of Computer Vision, Vol. 12, No. 2-3, pp. 137-172, May.

S. B. Kang and K. Ikeuchi (1993): "Toward Automatic Robot Instruction from Perception - Recognizing a Grasp from Observation", IEEE Trans. Robotics and Automation, Vol. 9, No. 4, pp. 432-443, August.

S. B. Kang and K. Ikeuchi (1993): "The complex EGI: the new representation for 3-D pose determination" IEEE Trans. Pattern Analysis and Machine Intelligence, Vol. 15, No. 7, pp. 707-721, July.

H. Delingette, M. Hebert and K. Ikeuchi (1992): "Shape Representation and Image Segmentation using Deformable Surfaces", Image and Vision Computing, Vol. 10, No. 3, pp.132-144, April.

K. Sato, K. Ikeuchi and T. Kanade (1992): "Model Based Recognition of Specular Objects using Sensor Models", Computer Vision, Graphics, and Image Processing: Image Understanding, Vol.55, No.2, pp.155-169, March.

K. Ikeuchi and R.C. Robert (1991): "Modeling Sensor Detectability with VANTAGE Geometric/Sensor Modeler", IEEE Trans. Robotics and Automation, Vol. 7, No. 6, pp.771-784, December.

K. Ikeuchi and K. Sato (1991): "Determining Reflectance Properties of an Object using Range and Brightness Images", IEEE Trans. Pattern Analysis and Machine Intelligence, Vol.13, No. 11, pp.1139-1153, November.

S.K. Nayar, K. Ikeuchi, and T. Kanade (1991): "Shape from Interreflections", Intern. Journal of Computer Vision, Vol. 6, No. 3, pp.173-195, August.

S.K. Nayar, K. Ikeuchi, and T. Kanade (1991): "Surface reflection: physical and geometrical perspectives", IEEE Trans. Pattern Analysis and Machine Intelligence, Vol. 13, No. 7, pp.661-634, July.

K. Ikeuchi and K.S. Hong (1991): "Determining Linear Shape Change: Toward Automatic Generation of Object Recognition Programs", Computer Vision, Graphics, and Image Processing: Image Understanding, Vol.53, No.2, pp.154-170, March.

S.K. Nayar, K. Ikeuchi, and T. Kanade (1990): "Extracting Shape and Reflectance of Hybrid Surfaces by Photometric Sampling", IEEE Trans. Robotics and Automation, Vol. 6, No. 4, pp.418-431, August.

K. Ikeuchi and T. Kanade (1989): "Modeling Sensors: Toward Automatic Generation of Object Recognition Program", Computer Vision, Graphics, and Image Processing, Vol. 48, pp.50-79.

K. Ikeuchi and T. Kanade (1988): "Automatic Generation of Object Recognition Program", Proceedings of The IEEE, Vol.76, No.8, pp.1016-1035, August.

K. Ikeuchi (1987): "Generating an Interpretation Tree from a CAD Model for 3-D Object Recognition in Bin-Picking Tasks", Intern. Journal of Computer Vision, Vol. 1, No. 2, pp.145-165.

K. Ikeuchi (1987): "Determining a Depth Map using a Dual Photometric Stereo", Intern. Journal of Robotics Research, Vol. 6, No. 1, pp.15-31, January.

K. Ikeuchi, K. Nishihara, B.K.P. Horn, P. Sobalvarro, and S. Nagata (1986): "Determining Grasp Configurations using Photometric Stereo and the PRISM Binocular Stereo System", The Intern. Journal of Robotics Research, Vol. 5, No. 1, pp.46-65, January.

B.K.P. Horn and K. Ikeuchi (1984): "The Mechanical Manipulation of Randomly Oriented Parts", Scientific American, Vol. 251, No. 2, pp.100-111, August.

K. Ikeuchi (1984): "Shape from Regular Patterns", Artificial Intelligence, Vol. 22, No. 1, pp.49-75, January.

K. Ikeuchi (1981): "Determining Surface Orientation of Specular Surfaces by using the Photometric Stereo Method", IEEE Trans. Pattern Analysis and Machine Intelligence, Vol.3, No.6, pp.661-669, November.

K. Ikeuchi and B.K.P. Horn (1981): "Numerical Shape from Shading and Occluding Boundaries," Artificial Intelligence, Vol. 17, Nos. 1-3, pp.141-184.

### **BOOKS (English)**

K. Ikeuchi and Y. Sato (2001): Modeling from Reality, Kluwer Academic Pub.

K. Ikeuchi and M. Veloso (1997): Symbolic Visual Learning, Oxford Univ Press.

### **BOOKS (Japanese)**

M. Ejiri, Y.Ohta, K. Ikeuchi (1990): Machine Vision, Shoko-Do

### **BOOKS: Contribution (English)**

K. Ikeuchi and M. Hebert (1995): "Spherical Representations: from EGI to SAI," Object Representation in Computer Vision, pp.327-346, M. Hebert, J. Ponce, T. Boult, and A. Gross (eds.), Springer-Verg.

K. Ikeuchi and M. Hebert (1995): "Task-Oriented Vision", Exploratory Vision: The Active Eye, pp.257-278, M.S. Landy, L. T. Maloney, and M. Pavel (eds.), Springer-Verg.

K. Ikeuchi (1994): "Surface Reflection Mechanism", Handbook of Pattern Recognition and Image Processing: Computer Vision, pp. 131-160, T.Y. Young (ed.), Academic Press.

K.D. Gremban and K. Ikeuchi (1993): "Appearance-Based Vision and the Automatic Generation of Object Recognition Programs", 3D Object Recognition Systems, pp.229-258, A. Jain and P. Flynn (eds.), Elsevier

C. Cerrada, K. Ikeuchi, L. Weiss, and R. Reddy (1991): "A 3D-object reconstruction system integrating range-image processing and rapid prototyping," Engineering Systems with Intelligence, pp. 333-340, Kluwer Academic Press, Boston.

K. S. Hong and K. Ikeuchi (1990): "Generating a strategy for configuration determination: a module of vision algorithm compiler for object localization programs", Robotics Research: 5, pp.99-106, H. Miura and S. Arimoto (eds.), MIT Press, Cambridge.

S. K. Nayar and K. Ikeuchi (1989): "Photometric Sampling: A Method for Determining Shape and Reflectance of Surfaces", Machine Vision for Inspection and Measurement, pp.137-184, H. Freeman (ed.), Academic Press, New York.

K. Ikeuchi and T. Kanade (1988): "Modeling Sensor Performance for Model-Based Vision", *Robotics Research*: 4, pp.255-263, R. Bolles and B. Roth (eds.), MIT Press, Cambridge.

K. Ikeuchi (1986): "A Vision System for Bin-picking Tasks Guided by an Interpretation Tree from a CAD Model", *Science on Form*, pp.265-272, K. Ishizaka (ed.), Kluwer Academic Publisher, Boston.

K. Ikeuchi, B.K.P. Horn, S. Nagata, T. Callahan, and O. Feingold (1984): "Picking up an Object from a Pile of Objects", *Robotics Research*: 1, pp.140-162, M. Brady and R. Paul (eds.), MIT Press, Cambridge.

Y. Shirai, K. Koshikawa, M. Oshima, and K. Ikeuchi (1984): "An Approach to Object Recognition using 3-D Solid Models", *Robotics Research*: 1, pp.465-474, M. Brady and R. Paul (eds.), MIT Press, Cambridge.

K. Ikeuchi and B.K.P. Horn (1981): "Numerical Shape from Shading and Occluding Boundaries", *Computer Vision*, M. Brady (ed.), pp.141-184, North-Holland, Amsterdam.