

Curriculum Vitae

NAME: Rei Kawakami

BIRTH DATE: February, 15th, 1980

AFFILIATION: Specially Appointed Associate Professor, Tokyo Institute of Technology

SPECIALIZATION: Computer Vision, Computer Graphics, Machine Learning

LANGUAGE: English (fluent), Japanese (native)

EDUCATION:

March 2003 Graduated from Department of Electronic Engineering, the University of Tokyo

March 2005 Received M. degree in Information Science and Technology, the University of Tokyo

March 2008 Received Ph.D. in Information Science and Technology, the University of Tokyo

WORK EXPERIENCE:

April 2008 to June 2010

Project research associate, Computer Vision Lab, the University of Tokyo

July 2010 to December 2010

Visiting researcher, Microsoft Research Asia

Postdoctoral fellow, Computer Vision Lab, the University of Tokyo

January 2011 to March 2011,

Project research associate, Computer Vision Lab, the University of Tokyo

April 2011 to March 2013

Postdoctoral scholar, University of California, Berkeley

Postdoctoral fellow, Computer Vision Lab, the University of Tokyo

March 2013 to December 2013

Project researcher, Osaka University

January 2014 to December 2017

Assistant professor, the University of Tokyo

January 2018 to March 2020

Specially appointed lecturer, the University of Tokyo

April 2020 to March 2022

Specially appointed Associate Professor, Tokyo Institute of Technology
Senior Researcher, Denso IT Laboratory, Inc.

April 2022 to Present

Associate Professor, Tokyo Institute of Technology

PUBLICATIONS

Book Chapter (English)

R. Kawakami, R. T. Tan, K. Ikeuchi (2008): Consistent Surface Color for Texturing Large Objects in Outdoor Scenes, Digitally Archiving Cultural Objects, K. Ikeuchi and D. Miyazaki (Eds), Springer, pp.279-294.

A. Ikari, R. Kawakami, R. T. Tan, K. Ikeuchi (2008): Separating Illumination and Surface Reflectance from Multiple Color Signals, Digitally Archiving Cultural Objects, K. Ikeuchi and D. Miyazaki (Eds), Springer, pp.297-319.

Book Chapter (Japanese)

R. Kawakami (2010): Basics of Reflection Property Modeling, Robot Informatics Handbook, J. Matsubara, I. Noda, F. Matsuno, M. Inami and K. Osuga (Eds), Nano-Optonics Energy, Inc. pp.276-286.

Refereed Journals (English)

Wen Shao, Rei Kawakami, and Takeshi Naemura (2022): Anomaly Detection Using Spatio-Temporal Context Learned by Video Clip Sorting, IEICE Transactions on Information and Systems, Volume E105.D, Issue 5, Pages 1094-1102.

Wen Shao, Rei Kawakami, Ryota Yoshihashi, Shaodi You, Hidemichi Kawase, Takeshi Naemura (2020): Cattle detection and counting in UAV images based on convolutional neural networks, International Journal of Remote Sensing (IJRS). **[Len Curtis Award]**

Yinan Wang, Ryota Yoshihashi, Rei Kawakami, Shaodi You, Toru Harano, Masahiko Ito, Katsura Komagome, Makoto Iida, and Takeshi Naemura (2019): Unsupervised Anomaly Detection with Compact Deep Features for Wind Turbine Blade Images Taken by a Drone, IPSJ Transactions on Computer Vision and Applications (CVA).

Ryota Yoshihashi, Tu Tuan Trinh, Rei Kawakami, Makoto Iida, and Takeshi Naemura (2018):

Pedestrian Detection with Motion Features via Two-stream ConvNets, IPSJ Transactions on Computer Vision and Applications (CVA), Vol.10, Issue12.

Ryota Yoshihashi, Rei Kawakami, Makoto Iida, and Takeshi Naemura (2017): Bird detection and species classification with time-lapse images around a wind farm: Dataset construction and evaluation, Wind Energy, Vol.20 Issue 12, pages 1983-1995, 2017.

A. Takeki, T. T. Trinh, R. Yoshihashi, R. Kawakami, M. Iida, and T. Naemura (2016): Combining deep features for object detection at various scales: Finding small birds in landscape images, IPSJ Transactions on Computer Vision and Applications (CVA).

S. You, R. T. Tan, R. Kawakami, Y. Mukaigawa and K. Ikeuchi (2016): Adherent raindrop: modeling, detection and removal in video, IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), Vol. 38, No. 9, pp.1721-1733.

R. Kawakami, H. Zhao, R. T. Tan and K. Ikeuchi (2013): Camera Spectral Sensitivity and White Balance Estimation from Sky Images, International Journal of Computer Vision (IJCV), Vol. 105, No. 3, pp.187-204.

K. Inose, S. Shimizu, R. Kawakami, Y. Mukaigawa, and K. Ikeuchi (2013): Refining outdoor photometric stereo based on sky model, IPSJ Transactions on Computer Vision and Applications (CVA), Vol.5, pp.104-108.

D. Miyazaki, M. Ammar, R. Kawakami and K. Ikeuchi (2009): Estimating Sunlight Polarization Using a Fish-eye Lens, IPSJ Transactions on Computer Vision and Applications (CVA), Vol. 1, pp.288-300.

R. Kawakami, J. Takamatsu and K. Ikeuchi (2007): Color Constancy from Blackbody Illumination, Journal of the Optical Society of America A. (JOSA.A), Vol. 24-7, pp.1886-1893, July, 2007.

Refereed Journals (Japanese)

T. Morimoto, R. T. Tan, R. Kawakami and K. Ikeuchi (2010): Use of Spider Model to Decompose Complex Reflection Components, Journal of the Institute of Image Information and Television Engineers (ITE) Vol. 64, No. 4, pp.603-610.

S. Ono, R. Kawakami, T. Oishi and K. Ikeuchi (2010): 3D Modeling of Cultural Heritage Objects:

Activities in Somma and Pompei, Journal of the Institute of Image Information and Television Engineers (ITE) Vol. 64, No.6, pp.766-769.

S. Okura, R. Kawakami and K. Ikeuchi (2009): Diffuse Reflectance Estimation of Outdoor Objects by Simultaneous Radiance Capture of Surfaces and Illumination Environment, IPSJ Transactions on Computer Vision and Image Media (SIG-CVIM), Vol.2, No.1, pp.32-41.

Refereed Conference papers

Ikuro Sato, Ryota Yamada, Masayuki Tanaka, Nakamasa Inoue, Rei Kawakami. PoF: Post-Training of Feature Extractor for Improving Generalization, In Proc. of International Conference on Machine Learning, (ICML2022), (Spotlight) July, Baltimore, (2022).

Shingo Yashima, Teppei Suzuki, Kohta Ishikawa, Ikuro Sato, Rei Kawakami. Feature Space Particle Inference for Neural Network Ensembles. In Proc. of International Conference on Machine Learning, (ICML2022), (Spotlight), July, Baltimore, (2022).

Yutaro Honda, Rei Kawakami, Ryota Yoshihashi, Kenta Kato, Takeshi Naemura. Pass Receiver Prediction in Soccer Using Video and Players' Trajectories. In Proc. of 8th International Workshop on Computer Vision in Sports (CVsports) at CVPR, June, New Orleans, (2022).

K. Takayama, I. Sato, T. Suzuki, R. Kawakami, K. Uto, K. Shinoda. Smooth Transfer Learning for Source-to-Target Generalization. NeurIPS Workshop on Distribution Shifts, (2021).

N. Inoue, R. Yamada, R. Kawakami, I Sato. Disentangling Latent Group of Factors. In Proc. of International Conference on Image Processing (ICIP), (2021).

Y. Kodama, Y. Wang, R. Kawakami, T. Naemura. Open-set Recognition with Supervised Contrastive Learning. In Proc. of International Conference on Machine Vision and Applications (MVA), (2021).

H. Oi, R. Kawakami, T. Naemura. Analysis of Evaluation Metrics with the Distance between Positive Pairs and Negative Pairs in Deep Metric Learning. In Proc. of International Conference on Machine Vision and Applications (MVA), (2021).

Y. Honda, R. Kawakami, and T. Naemura. RNN-based Motion Prediction in Competitive Fencing Considering Interaction between Players. In Proc. of British Machine Vision Conference (BMVC),

(2020).

R. Yoshihashi, W. Shao, R. Kawakami, S. You, M. Iida, and T. Naemura (2019): Classification-Reconstruction Learning for Open-Set Recognition. In Proc. of IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR).

T. T. Trinh, R. Yoshihashi, R. Kawakami, M. Iida, and T. Naemura (2016): Bird Detection near Wind Turbines from High-resolution Video using LSTM Networks, In Proc. of 16th World Wind Energy Conference and Exhibition (WVEC).

A. Takeki, T. T. Trinh, R. Yoshihashi, R. Kawakami, M. Iida, and T. Naemura (2016): Detection of small birds in large images by combining a deep detector with semantic segmentation, In Proc. of IEEE International Conference on Image Processing (ICIP).

R. Yoshihashi, R. Kawakami, M. Iida, and T. Naemura (2015): Evaluation of bird detection using time-lapse images around a wind farm, In Proc. of European Wind Energy Association Conference (EWEA).

R. Yoshihashi, R. Kawakami, M. Iida, T. Naemura (2015): Construction of a bird image dataset for ecological investigations, In Proc. of IEEE International Conference on Image Processing (ICIP).

S. You, R. T. Tan, R. Kawakami, and K. Ikeuchi (2014): Raindrop Detection and Removal from Long Range Trajectories, In Proc. of Asian Conference on Computer Vision (ACCV).

S. You, R. T. Tan, R. Kawakami, and K. Ikeuchi (2013): Adherent Raindrop Detection and Removal in Video, In Proc. of IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR).

S. You, R. T. Tan, R. Kawakami, and K. Ikeuchi (2013): Robust and Fast Motion Estimation for Video Completion, In Proc. of IAPR Conference on Machine Vision Applications (MVA).

R. Kawakami, J. Wright, Y. Tai, M. Ben-Ezra, Y. Matsushita and K. Ikeuchi (2011): High-resolution Hyperspectral Imaging via Matrix Factorization, In Proc. of IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR).

T. Morimoto, R. T. Tan, R. Kawakami and K. Ikeuchi (2011): Accuracy of the spider model in

decomposing layered surfaces, In Proc. of Color and Photometry in Computer Vision (CPCV), in conjunction with IEEE International Conference on Computer Vision.

L. B. Vinh, T. Kakuta, R. Kawakami, T. Oishi and K. Ikeuchi (2010): Foreground and Shadow Occlusion Handling for Outdoor Augmented Reality, In Proc. of 9th IEEE International Symposium on Mixed and Augmented Reality (ISMAR).

T. Morimoto, R. T. Tan, R. Kawakami and K. Ikeuchi (2010): Estimating Optical Properties of Layered Surfaces Using the Spider Model, In Proc. of IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR).

S. Hirose, T. Suenaga, K. Takemura, R. Kawakami, J. Takamatsu and T. Ogasawara (2010): Surface Color Estimation Based on Inter- and Intra-Pixel Relationships in Outdoor Scenes, In Proc. of IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR).

R. Kawakami and K. Ikeuchi (2009): Color Estimation from a Single Surface Color, In Proc. of IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR).

T. Kakuta, L. B. Vinh, R. Kawakami, T. Oishi and K. Ikeuchi (2008): Detection of Moving Objects and Cast Shadows Using a Spherical Vision Camera for Outdoor Mixed Reality, ACM Symp. on Virtual Reality Software and Technology (VRST).

S. Okura, R. Kawakami, K. Ikeuchi (2007): Simple Surface Reflectance Estimation of Diffuse Outdoor Object using Spherical Images, in Proc. of Workshop on Multi-dimensional and Multi-view Processing in conjunction with 8th Asian Conference on Computer Vision.

R. Kawakami, K. Ikeuchi (2007): Stabilizing Illumination Chromaticity Estimation using the Illumination Line Segment, in the Proceeding of the Tenth IAPR Conference on Machine Vision Applications (MVA), pp.437-440.

D. Miyazaki, M. Kamakura, T. Higo, Y. Okamoto, R. Kawakami, T. Shiratori, A. Ikari, S. Ono, Y. Sato, M. Oya, M. Tanaka, K. Ikeuchi, M. Aoyagi (2006): 3D Digital Archive of the Burghers of Calais, In the Proc. of the International Conference on Virtual Systems and Multimedia (VSMM), Lecture Notes in Computer Science.

R. Kawakami, R. T. Tan, K. Ikeuchi (2005): Consistent Surface Color for Texturing Large Objects

in Outdoor Scenes, in Proceedings of the Tenth IEEE International Conference on Computer Vision (ICCV), Vol.2, pp.1200-1207.

R. Kawakami, R. T. Tan, K. Ikeuchi (2004): A Robust Framework to Estimate Surface Color From Changing Illumination, in Proceedings of the Sixth Asian Conference on Computer Vision (ACCV), Vol.2, pp.1026-1031, Jeju, Korea.

Papers in preparation

R. Kawakami, R. Yoshihashi, S. Fukuda, S. You, M. Iida, T. Naemura (2019): Cross-connected Networks for Multi-task Learning of Detection and Segmentation.

W. Shao, R. Kawakami, R. Yoshihashi, S. You, H. Kawase, T. Naemura (2019): Cattle detection and counting in UAV images based on convolutional neural networks.

R. Yoshihashi, R. Kawakami, S. You, M. Iida, T. Naemura (2019): Differentiating objects by motion: Joint detection and tracking of small flying objects.

K. Moriwaki, R. Yoshihashi, R. Kawakami, S. You, T. Naemura (2019): Single-Image-based HDR Reconstruction with Physical, Perceptual and Adversarial constraints.

TALK

Invited Talk

S. You, R. T. Tan, R. Kawakami, K. Ikeuchi (2013): Adherent Raindrop Detection and Removal in Video, Meeting on Image Recognition and Understanding (MIRU), Invited talk session, Tokyo, Japan.

R. Kawakami (2013): 6 th Core project review, Meeting on Image Recognition and Understanding (MIRU), Industry-academia partnership session, Tokyo, Japan.

R. Kawakami, J. Wright, Y. Tai, M. Ben-Ezra, Y. Matsushita and K. Ikeuchi (2011): High-resolution Hyperspectral Imaging for Cultural Heritage, Dunhuang Forum: International Conference on Cultural Heritages and Digitization, Dunhuang, China.

R. Kawakami, S. Hirose, J. Takamatsu and K. Ikeuchi (2010): Color estimation from a single surface color, MSRA Keio-GCOE Workshop, Microsoft Research Asia.

Seminar Talk

R. Kawakami (2013): What can photometric analysis reveal for computer vision? 1st Thai-Japan International Workshop on Computer Vision, Kasesaat University, Thailand, August 2013.

R. Kawakami, T. Morimoto, R. T. Tan, J. Wright, Y. Tai, M. Ben-Ezra, Y. Matsushita and K. Ikeuchi (2011): Measurement and Analysis of Photometric Properties for e-Heritage, Graduate Seminar in Chinese Academy of Science and Technology, Feb.

R. Kawakami, T. Morimoto, R. T. Tan and K. Ikeuchi (2010): Estimating Optical Properties of Layered Surfaces Using the Spider Model, Robust Computer Vision Workshop in Chonnam National University. Dec.

R. Kawakami, S. Hirose, J. Takamatsu and K. Ikeuchi (2010): Color estimation from outdoor illumination, Joint Seminar in Osaka University. April.

R. Kawakami, S. Hirose, J. Takamatsu and K. Ikeuchi (2010): Probabilistic and Deterministic Approaches for Color estimation, Graduate Seminar in Peking University. March.

AWARD

Outstanding reviewer, CVPR 2019

Outstanding reviewer award, Meeting on Image Recognition and Understanding (MIRU) 2018

Outstanding reviewer award, Meeting on Image Recognition and Understanding (MIRU) 2017

IPSJ Yamashita Prize, 2009

Best paper award, A. Wada, R. Kawakami, S. Kudoh, K. Ikeuchi, K. Komachiya, T. Miura, S. Matsui and M. Fujihata (2009): Shading Analysis of Paintings Based on Real-World Objects and Illumination, IPSJ CVIM Workshop.

PATENT

Japanese Patent:

発明の名称：計測装置および計測方法

出願番号：特願2013-187617

登録番号：特許第6372018号

登録日：2018/07/27

知財部管理番号：24B12Y001-1

PROFESSIONAL ACTIVITIES

Editorial work:

Associate Editor, International Journal of Computer Vision, Springer

Associate of EIC, Encyclopedia of Computer Vision, Springer

Editor, IEICE Trans. on Information and Systems

Editor, IPSJ “Information Processing”

Workshop & conference organizer:

ACM MM Asia 2022, Program Chair

E-Heritage Workshop, ICCV 2019, Program Chair

Machine Vision and Application (MVA) 2019, Tutorial chair

Machine Vision and Application (MVA) 2017, Organizer

E-Heritage Workshop, ACCV 2012, Program Chair

E-Heritage Workshop, ACCV 2010, Program Chair

Area chair:

Computer Vision and Pattern Recognition (CVPR) 2022

3DV 2022

3DV 2021

Computer Vision and Pattern Recognition (CVPR) 2020

Winter Conference on Applications of Computer Vision (WACV) 2020

Machine Vision and Application (MVA) 2019

ACM Multimedia (ACMMM) 2018

Asian Conference on Computer Vision (ACCV) 2018

Machine Vision and Application (MVA) 2017

PC member:

PC member, AAAI 2020

Senior PC member, IJCAI 2020

Senior PC member, IJCAI 2019

PC member, Color and Photometry in Computer Vision (CPCV), in conjunction with ECCV 2013

PC member, International Workshop on Color and Photometry in Computer Vision (CPCV), in conjunction with ECCV 2012, ICCV 2011

PC member, IEEE Color and Photometry in Computer Vision Workshop (CPCV), in conjunction with ICCV 2011

PC member, Color and Reflectance Workshop, in conjunction with ICCV 2009

Reviewer:

TPAMI, IJCV, TIP, JOSA, ICCV, CVPR, SIGGRAPH, ECCV, ACCV, ISMAR, ICIP, PSIVT, SCIA, ICPR, ACPR

STUDENT SUPERVISION AND COLLABORATION

W. Shao (Master student, U-Tokyo): April 2017 – March 2020
Y. Wang (Master student, U-Tokyo): April 2018 – March 2020
Y. Kodama (Master student, U-Tokyo): April 2018 – March 2021
L. Suzuki (Master student, U-Tokyo): April 2019 – March 2021
C. Kukulprasong (Undergrad student, U-Tokyo): April 2019 – March 2020
Y. Honda (Undergrad student, U-Tokyo): April 2019 – March 2020
R. Yoshihashi (Ph.D student, U-Tokyo): January 2014 – March 2019
K. Moriwaki (Master student, U-Tokyo): April 2017 – March 2019
K. Taguchi (Undergrad student, U-Tokyo): April 2018 – September 2019
S. Fukuda (Master student, U-Tokyo): April 2016 – March 2018
T. T. Trinh (Master student, U-Tokyo): April 2015 – March 2017
S. Oh (Undergrad student, U-Tokyo): April 2016 – March 2017
A. Takeki (Undergrad student, U-Tokyo): April 2015 – March 2016
T. H. Ba (Undergrad student, U-Tokyo): January 2014 – March 2016
S. You (Ph.D student, U-Tokyo): October 2010 – September 2015
T. Kawaguchi (Master student, U-Tokyo): April 2013 - March 2015
K. Watanabe (Master student, U-Tokyo): April 2013 – March 2015
S. Ishiguro (Master student, U-Tokyo): April 2013 - March 2015
R. Gotoh (Master student, U-Tokyo): April 2013 - March 2015
K. Inose (Ph.D student, U-Tokyo): April 2012 – May 2014
K. Suzuki (Master student, U-Tokyo): April 2012 – March 2014
T. Ikegami (Master student, U-Tokyo): April 2012 – March 2014
S. Shimizu (Master student, U-Tokyo): April 2011 – March 2013
H. Zhao (Ph.D student, U-Tokyo): April 2007 – March 2012
Y. Kobayashi (Master student, U-Tokyo): April 2009 – March 2011
L. B. Vinh (Ph.D student, U-Tokyo): April 2006 – March 2011
W. Zhou (Master student, U-Tokyo): October 2009 – March 2010
R. Kudoh (Master student, U-Tokyo): April 2008 – March 2010
A. Wada (Master student, U-Tokyo): April 2009 – March 2011

S. Hirose (Master student, NAIST): April 2008 – March 2010

T. Morimoto (Ph.D student, U-Tokyo): October 2006 – September 2009

S. Okura (Master student, U-Tokyo): April 2007 – March 2009

TECHNICAL EXPERIENCES

Programming language: C/C++, MATLAB, Java, OpenCV, Perl, OpenGL, python.

Operating system: Windows, Linux, Unix.