



Advanced Multimedia Processing

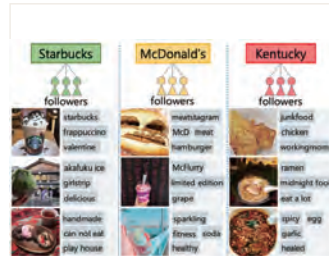
Our main research interests have a wide spectram: multimedia, computer vision, pattern recognition, machine learning, deep learning, natural language processing, , and computer graphics using multimodal data. We are interested not only in fundamental problems but also implementation to real-world businesses. We have a lot of collaboration projects with a lot of international companies and universities. Therefore, we can touch real-world data and get feedbacks from real services.



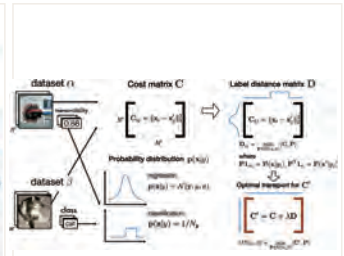
Attractiveness Computing

We are interested in analyzing why and how we are attracted to specific persons, content, and services. We have been trying to analyze, tell reasons, and even enhance such "attractiveness" in multimedia big data. We are not doing re-search on application oriented topics, but trying to solve fundamental research problems behind them.

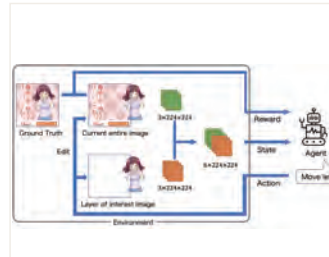
- Presentation and online-lecture analysis
- Impression analysis of advertisements and product design
- Social popularity analysis and enhancement in SNSs
- Consumer behavior analysis and maketing
- Matching and recommendation
- Photo editing (digital makeup, Instagrammability)
- Photo/video quality assessment and enhancement
- Video summarization and mash-up
- Real-estate tech (ReTech) using AI and IoT
- Travel rech (route design, photo shooting)



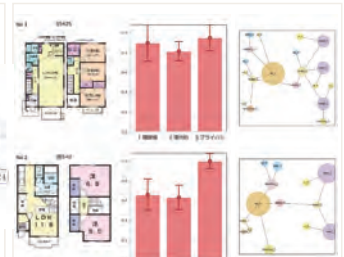
Consumer analysis using SNS



Transferability analysis



Banner design using RL



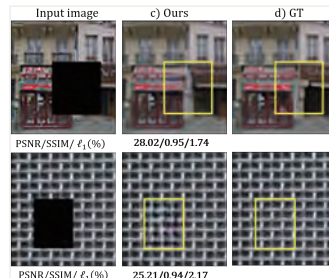
Attractiveness of apartments



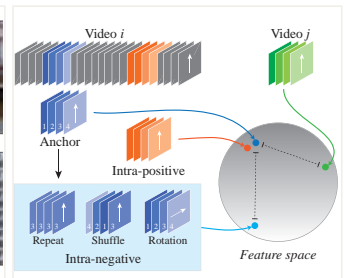
Machine Learning Frontiers

We have been working on novel machine learning algorithms, not simple extensions of existing algorithms.

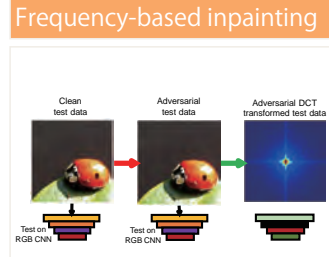
- * Learning with few/imperfect training data
- We are working on hierarchical transfer learning, unpaired learning, weakly-supervised learning, contrastive learning, and so on for robust and practical applications.
- * Reliable learning
- We have been working on understanding mechanisms and its defense of adversarial examples and fooling images. Besides, we are working on fake image/video detection.
- * Reinforcement learning and meta learning
- We have been working on deep learning based photo/video procesing. In particular, we are interested in reinforcement learning for image editing, filtering, video summarization and so on.



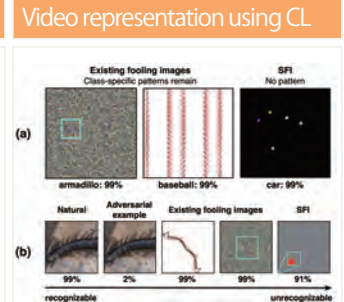
Frequency-based inpainting



Video representation using CL



Adversarial attack defence

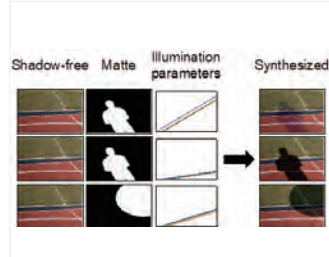


Sparse fooling images

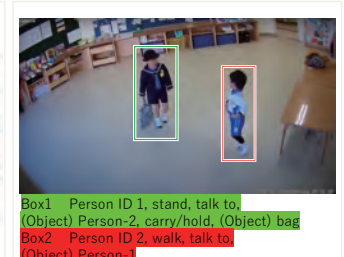


Other Challenging Problems

- We are also challenging new research topics aiming at widening our research activities.
- Medical image analysis
 - Tools for illustration drawing and CG generation
 - Nursery school and eldary care house sensing
 - Enviroment sensing using our own IoT devices
 - Deep learning in severe env such as space
 - Action recognition and retrieval
 - Fundamental CV problems such as feature point matching, inpainting, super-resolution, etc.



Shadow synthesis and removal



Action dataset construction