

医用画像と画像処理 (工藤 博幸)

Medical Imaging and Image Processing (KUDO Hiroyuki)



KUDO Hiroyuki, Ph.D.
 Professor
 Faculty of Engineering,
 Information and Systems
 University of Tsukuba

E-mail address: kudo@cs.tsukuba.ac.jp
 URL: <http://www.cs.tsukuba.ac.jp/~kudo/japanese.html>



医用画像と画像処理の研究

私の研究分野は、医用画像と画像処理です。CT（コンピュータトモグラフィ）やPET（ポジトロンCT）と呼ばれる装置において画像を生成する画像処理の研究、医用画像を解析して病変を検出して医師の診断を支援する計算機支援診断、医用画像を解析して人体の3Dモデルを構築して手術のシミュレーションやナビゲーション他に応用する計算解剖学、医用応用を意識した先端の画像処理やコンピュータビジョン、などに関する研究を行っています。特に、CTやPETの画像を生成する画像処理を扱う画像再構成の分野では、世界のトップを走っている研究者だと自負しています。

Research on Medical Imaging and Image Processing

My research fields are medical imaging and image processing. I am mainly working on the following four research subjects. The first subject is the research on image processing, which aims at generating cross-sectional images in CT and PET imaging modalities. The second subject is the research on Computer-Aided-Diagnosis, which aims at supporting the diagnosis by MD using medical image processing techniques. The third subject is the research on Computational Anatomy, which aims at generating 3-D digital model of human atlas together with applying it to, for example, simulation and navigation of surgeries. The last one is the research on newest image processing and computer vision, aiming at applying them to medicine. In particular, I am believing that I am one of top runners in the field of image reconstruction in CT and PET.

Medical Imaging and Image Processing

Computed Tomography

New paradigm of CT imaging

Low-Dose CT
Sparse-View CT
Interior CT

Image reconstruction, 3-D and 4-D CT imaging, Low-dose CT, PET (Positron emission tomography), Electron tomography, X-ray phase tomography

We are joining two very large first-priority national projects

Medical Image Processing

Mathematical Image Processing

Compressed sensing, Convex optimization, Machine learning, Energy minimization, Nonlinear analysis, Graph algorithms

Compressed sensing denoising

Total Variation inpainting

Graphcut segmentation