数理情報学（安東 弘泰）
Mathematical informatics (ANDO Hiroyasu)

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生物模倣モデルの実社会システムへの応用

社会システムの構造を知るために様々な数理的手法（モデル化、シミュレーション、理論解析）を駆使して研究しています. 特に, 生物の巧妙な仕組みに着目し, それらを参考にした理論やモデルの構築と, その実社会システム（交通、エネルギーマネジメントなど）への応用可能性を検討しています. 具体的には, 脳や循環器などを複雑なネットワークシステムとしてとらえ, その生理学的知見をもとに, IT, 交通インフラ, 次世代パワーエレクトロニクス, 革新的疾病治療法などの幅広い分野へ応用可能な理論の構築を目指しています. 近年の人工知能技術は, 神経回路網の工学的応用から生まれた技術といえます.

Application of bio-inspired model to real world systems

In our laboratory, various mathematical approaches such as modelling, numerical simulation, theoretical analysis are focused in order to understand the mechanism and structure of real world systems. Specifically, bio-inspired or bio-mimetic model is a key concept of our research group so that we are aiming to propose basic theory and models of real world systems, e.g. traffic systems, energy management systems, and so on. For example, we consider the brain and cardiovascular systems as a complex network system and based on the physiological knowledge on those systems, we try to invent a theory applicable to a wide variety of field ranging from engineering to medicine, namely IT, traffic infrastructure, next generation power electronics, innovative disease treatment. Recent development of artificial intelligence technologies is derived from neural networks applied to engineering systems.

Neural Networks for phase reconstruction of magnitude spectrograms