アンダーソン教授　シリーズ講義のご案内

オーストラリア国立大学名誉教授 Brian D. O. Anderson 先生によります、シリーズ講義を下記の要領で開催いたします。適応制御とフォーメーションについて御講演いただき、ディスカッションを行います。なお、先着２０名様の参加とさせていただきます。

また、翌３月２０日（金）には、名古屋大学グローバルＣＯＥプログラム　マイクロ・ナノメカトロニクス教育研究拠点　若手研究者発表会が開催されます。こちらは参加自由となっており、事前申し込み、人数制限等はございませんので、皆様のご参加お待ちしております。

奮ってご参加くださるよう、ご案内申し上げます。

● Brian Anderson 教授　シリーズ講義

１．Adaptive Control 1: Historical origins and early linear system results
２．Adaptive Control 2: Practical approaches and Generic problems
３．Adaptive Control 3: Topical problems
４．Control and information architectures for formations

期日
平成２１年3月１８日（水）　１３：００　～　１５：３０
１９日（木）　１０：００　～　１７：００

会場
名古屋大学　工学部２号館２階　２２１講義室
（464-8603　愛知県名古屋市千種区不老町）

講師
オーストラリア国立大学名誉教授　Brian D. O. Anderson 先生

主催
名古屋大学　グローバルＣＯＥプログラム
マイクロ・ナノメカトロニクス教育研究拠点

協賛
社団法人 計測自動制御学会中部支部

定員
２０名（定員になり次第，締め切ります）

参加費
無料

関連ホームページ
http://www.micro-nano.jp

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講師紹介
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・オーストラリア科学アカデミー　元院長
（Former director of Australian Academy of Science Society）
・国際自動制御学会　元会長
（Former President of International Federation of Automatic Control）

・代表的著書
Brian D. O. Anderson and John B. Moore
Optimal Control: Linear Quadratic Methods. (Prentice-Hall)

講義概要
March 18, 13:30 ～15:30
Adaptive Control 1: Historical origins and early linear system results
Topics
Historical origins of adaptive control
MIT rule
Systematic approach based on linear-in-parameters models
The bursting problem
General structure of adaptive controller
Understanding some reasons for adaptive control failure (MIT rule, Bitmead et al)
Summary
The historical origins of adaptive control will be introduced, as well the early successful and unsuccessful attempts associated with the MIT rule, and a general approach to adaptive control with linear-in-parameters models, such as transfer functions with unknown coefficients. The general structure of adaptive controllers will be exhibited, and the crucial existence of three underlying time scales exposed. Understanding these time scales often is the key to explaining non-performance of proposed adaptive controllers.

March 19, 10:00 ～11:30
Adaptive Control 2: Practical approaches and Generic problems
Topics
Iterative Identification and Controller Redesign
Generic problems, impractical control objectives, transient instability, and changing experimental conditions
Windsurfer approach to adaptive control
Problem of sudden instability

Summary
The notion of iterative identification and controller redesign, as a tool for separating the interaction of identification and control loops, will be described, together with the possibility of failures using the method. Generic problems associated with most adaptive control tasks will be displayed—impractical control objectives, transient instability and changing experimental conditions. The windsurfer approach to adaptive control attempts to address these difficulties, and it will be outlined. One major practical problem remains elusive, that of dealing with suddent instability.,

March 19, 13:30 ～15:00
Adaptive Control 3: Topical problems
Topics
Iterative Feedback tuning
Multiple Model Adaptive control.
Validating of safety with a new controller.
Open issues
Summary
Iterative feedback tuning is a recent approach to adaptive control, based on making modest adjustments to controller parameters in the light of experimental data collected. The collection of this experimental data generally involves injecting special chosen signals into the plant. Multiple model adaptive control (MMAC), based on working with a finite collection of plants, is another recently developed approach, which has appeal both with linear and nonlinear plants. Satisfactory use of MMAC requires advance of the safety of replacing an existing controller by a proposed controller, and methods are becoming available for this; in the case of linear systems, they rely on Nyquist sorts of ideas.

March 19, 15:30 ～17:00
Control and information architectures for formations

Formations of robots, underwater vehicles and autonomous airborne vehicles are progressively being deployed to tackle problems of surveillance, bush fire control, and the like. Much formation behaviour mimics the behaviour of formations of living organisms, such as birds and fish.
A number of prototypical problems will be considered, starting with rendezvous and consensus. The presentation will consider the types of control, communications and sensing architecture that allow scalability for formations with many individual agents, and allow preservation of the formation shape, as well as merging, splitting, or closing ranks in the event of loss of one or more agents. The scalability requirement imposes a need for significant decentralization of information and control structures, and, just as in a formation of birds or fish, no one bird or fish can be expected to sense all other birds or fish and compute its own trajectory using even partial knowledge of the trajectories of all other individual birds or fish, so the amount of sensing, communication and control computation by any one agent has to be limited.

●名古屋大学グローバルＣＯＥ　若手研究者発表会のご案内

期日
　平成２１年3月２０日（金）　１３：００　～　１７：３０

会場
　名古屋大学　工学部ＩＢ館１階　０１１室、０１２室、０１３室
　（464-8603　愛知県名古屋市千種区不老町）

講演内容
- Robot Control
- Sensing and Application
- Medicine and Engineering
- Micro Nano Fluids
- Micro Nano Materials

定員
　定員なし

参加費
　無料

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