



学术报告

ACADEMIC LECTURE



报告人: Francis J. Doyle III (University of California, Santa Barbara)

报告题目: Engineering the Artificial Pancreas

报告时间: 7月31日上午10:00 -11:00

报告地点: 工控新楼501

Abstract:

Type 1 diabetes mellitus (T1DM) is a chronic autoimmune disease affecting approximately 35 million individuals world-wide. More than 30 years ago, the idea of an artificial endocrine pancreas for patients was envisioned. In the ensuing years, a number of theoretical research studies were performed with numerical simulations to demonstrate the relevance of advanced process control design to the artificial pancreas, with delivery algorithms ranging from simple PID, to H-infinity, to model predictive control. With the advent of continuous glucose sensing, and the development of hardware and algorithms to communicate with and control insulin pumps, the vision of closed-loop control of blood glucose is approaching a reality.

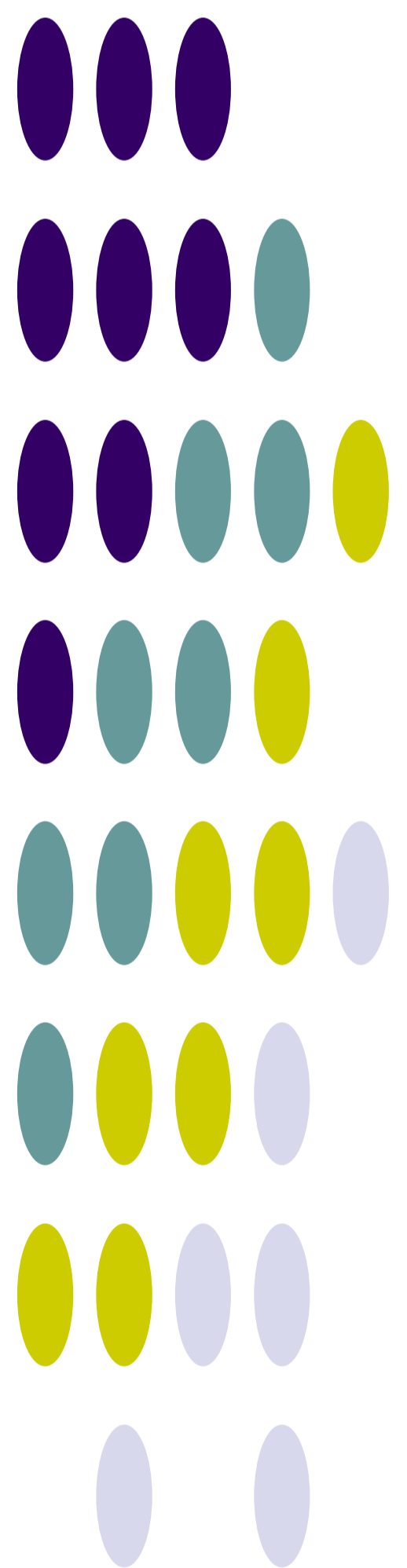
In the last 10 years, their research group has been working with medical doctors on clinical demonstrations of feedback control algorithms for the artificial pancreas. In this talk, he will outline the difficulties inherent in controlling physiological variables, the challenges with regulatory approval of such devices, and will describe a number of process systems engineering algorithms they have tested in clinical experiments for the artificial pancreas.

报告人简介:



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Pro. Frank Doyle received a B.S.E. degree from Princeton, C.P.G.S. from Cambridge, and Ph.D. from Caltech. Prior to his appointment at UCSB, he has held faculty appointments at Purdue University and the University of Delaware, and held visiting positions at DuPont, Weyerhaeuser, and Stuttgart University. He has been recognized as a Fellow of multiple professional organizations including: IEEE, IFAC, AIMBE, and the AAAS. He served as the editor-in-chief of the IEEE Transactions on Control Systems Technology from 2004-2009, and was the Vice President for Publications in the Control System Society from 2011-2012. In 2005, he was awarded the Computing in Chemical Engineering Award from the AIChE for his innovative work in systems biology, and in 2012 was a finalist for the WYSS Institute - IEEE EMBS Award for Translational Research. His research interests are in systems biology, network science, modeling and analysis of circadian rhythms, and drug delivery for diabetes.



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