



生物医学工程系  
Department of Biomedical Engineering

## 工学院“医工创新论坛”系列学术报告会 (Barry Belmont)

### 主题:

Multimodal non-invasive hemodynamic monitoring  
多模态无创血流动力学监测

### 讲座时间:

2018年6月22日 10:00-11:30

### 讲座地点:

Block A 行政中心 213 会议室

### 讲座内容:

许多医疗条件要求医护人员对患者的血流动力学进行快速准确的评估,以诊断和指导治疗。在包括血流动力学评估(如心率和血压)的众多参数中,有一个重要参数需要经过多次测量:血管内容积状态。测量一个受试者拥有多少血液来灌注氧气、输送营养物质、清除废物、体积状况,为血液透析中心中的许多急诊室和重症监护室的重症和危重症患者的治疗提供了基础。然而,尽管它在生理上起到的作用很重要,但许多当前的体积状态和反应性的评估的预测结果都存在很大的误差。这项工作旨在通过改进已经投入临床使用的技术(下腔静脉塌陷的超声测量)和引入另一种可以通过所有阶梯护理(动态呼吸阻抗容积评估)的技术来补救这个严重的误差。在许多临床环境上,这样的多模式血流动力学监测服务于医生和他们的病人,并且可能会改善这些结果。

Many medical conditions require health care providers to make rapid and accurate assessments of a patient's hemodynamics to diagnose and guide treatment. Of the parameters that encompass hemodynamic evaluation (such as heart rate and blood pressure), one remains woefully measured: intravascular volume status. A measure of how much blood a subject has with which to perfuse oxygen, deliver nutrients, and remove wastes, volume status lays the foundation of many types of fluid based treatments for the acutely and critically ill in emergency rooms and intensive care units to the chronically ill of cardiovascular and dialysis centers. Yet for all its physiological importance, many current assessments of volume status and responsiveness have a predictive power around the level of a coin flip. This work seeks to remedy this dire situation by improving a technique already utilized at the bedside (ultrasound measurement of inferior vena cava collapsibility) and introducing another that could be used through all echelons of care (dynamic respiratory impedance volume evaluation). Such a multimodal approach to hemodynamic monitoring serves the needs of both physicians and their patients across many clinical environments and ought to improve outcomes.

附上报告人介绍：



Barry Belmont 是美国密歇根大学生物医学工程系的讲师，也是上海交通大学密西根学院的客座讲师。他的工作涉及了医疗设备的各个领域，包括从设备开发到商业化、从研究到教学，主要着重于生理信号和图像处理的研究。Belmont 博士也曾在法律和政府部门工作，主要负责以客户需求为导向的医疗技术组合。他在美国密歇根大学获得生物医学工程博士学位，并拥有内华达大学机械工程和生物学学士双学位。

Barry Belmont is a Lecturer in the Department of Biomedical Engineering at the University of Michigan, serving also as an Adjunct Faculty for Shanghai Jiaotong University's Joint Institute. His work has spanned the spectrum of medical devices, from development to commercialization, from research to teaching, with an emphasis in physiological signal and image processing. Previously Dr. Belmont has worked in both legal and governmental sectors focusing on the medical technology portfolios of clients. He earned his Ph.D. in biomedical engineering from the University of Michigan and holds dual B.S. degrees in mechanical engineering and biology from the University of Nevada.

欢迎全校师生参加！

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