Dr Ben Hanson CV: Research & Academic

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Appointments

Associate Professor (part-time: 40%) in UCL Mechanical Engineering.
Self-employed engineering consultant specialising in foods & drinks for healthcare.

Research Summary

Dr Hanson's research involves biomedical applications of engineering including system modelling and analysis. He is internationally recognised for this work through citations for his publications in journals in diverse disciplines such as *Dysphagia* (5 papers, 567 citations), *Sensors & Actuators* (64 citations), *Psychological Medicine* (80 citations), and *J. Food Science* (69); 1,705 total citations with an h-index of 22 [Google scholar, August 2020]. This work has also attracted the interest of international media (The Guardian, BBC, Time magazine) and is funded by UK charities, international corporations, and the National Institutes for Health (USA).

Dr Hanson is particularly interested in the biomechanics of swallowing and the use of texture-modification of foods and drinks to manage swallowing disorders, "dysphagia", often associated with ageing, stroke, dementia or cancer. He provides the engineering contribution to the first global guidelines for dysphagia diets: IDDSI.org.

Teaching and Dissemination Summary

Dr Hanson was the Departmental Tutor with responsibility for all undergraduate teaching in UCL Mechanical Engineering from 2013-17, and won a UCL Provost's Teaching Award in 2011. He is the coordinator for 3rd year Dynamics & Control and lectures on the MSc module Applications of Biomedical Engineering.

In the previous 3 years Dr Hanson has given more than 15 invited presentations to industry and clinicians, often internationally; he has presented biomedical engineering to groups of 1,000 A-level students; he has delivered presentations by invitation of the UCL IBME and Science Club, and he hosts regular meetings comprising NHS, heads of clinical professional bodies and industrial representatives on standardisation of diets for medical purposes.

Educational videos & presentations are available on Ben Hanson's youtube channel

Qualifications & Career

1994 to 1998	**MEng** in Mechatronics (Distinction)	University of Leeds.
1998 to 2002	**PhD** in Mechanical Engineering	University of Leeds.
2002 to 30/09/2005	**Research Fellow**	University of Leeds.
01/10/2005 to present	**Associate Professor** (promoted from Lecturer in 2013 moved to part-time in 2019)	UCL, (HEFCE-funded, permanent)

Other Appointments and Affiliations

Fellow, Institution of Mechanical Engineers, since May 2015 (Member since July 2007).
Fellow, Higher Education Academy, since October 2009.
Member, Institute of Food Technologists, 2010-2011.
Affiliate, UCL Division of Medicine (Faculty of Biomedical Sciences), since September 2010.
Visiting Lecturer, Division of Engineering, Kings College London, 2011-2014.
Honorary Research Associate, UCLH Heart Hospital, since July 2012.
Departmental Tutor, UCL Mechanical Engineering, September 2013-17.

Prizes, Awards and Other Honours

Provost's Teaching Award, UCL, July 2011
Invited position on Board of International Dysphagia Diet Standardisation Initiative, October 2012.
Outstanding Contribution in International Achievement by the American Speech-Language-Hearing Association (ASHA), June 2016.

Grants and Funding (Competitively-awarded)

As Principal Investigator:

Co-PI on NIH 2R01DC011020-04 “Physiological Flow of Liquids Used in Dysphagia Management” £1.8M ($2.5M USD) 5 year award $457,693 for 2017.

IOS (iPhone) app software “iThicken” licenced through UCL Business from 2015.

4-year PhD Studentship with Fresenius-Kabi Ltd and UCL (“HEAL” MRes scheme + IBME). (fees, stipend & equipment) Start date: 01/10/2013. Duration: 4 years.
“Rheology of thickened drinks”.

Funded studentship: Philanthropic donation + UCL Impact scheme
£73k (fees & stipend) Start date: 8/7/2013. Duration: 3 years.
“Identifying a Model of the Control Systems Governing Cardiac Stability”.

Funded studentship: Crucible centre for Lifelong Health and Wellbeing, UCL. Co-I: Dr Christina Smith.
£86k (fees & stipend) Start date: 01/10/2010, Duration: 4 years.
“Prescribed diets: the effect of mechanical consistency on health, patient safety, and quality of life”.

Funded studentship: Crucible Centre for Lifelong Health and Wellbeing, UCL. Co-I: Prof David Holder.
£86k (fees & stipend), Start date: 01/10/2010, Duration: 4 years.
“Design of an electrode headset”.

EPSRC First Grant EP/G001200/1.
£259k (FEC), Start date: 01/10/2008. Duration: 2 years.
“A self-sensing instrument for investigation of rheology in dysphagia”.

EPSRC CASE studentship with Instron Ltd, CASE/CNA/07/72
£83k Start date: 01/11/2007, Duration: 3.5 years
“Performance improvement for electromagnetic motors”.

UCL Educational Research & Teaching Development Grants: E-Learning Development Grant, 2007, £1k; Academic Development Grant, 2010, £3k. Research outcomes were published in IEEE Trans. Ed. Tech.

As Co-Investigator

BHF Project Grant no. PG/16/81/32441
£287K, Start date 01/02/2017, Duration: 3 years. “Enabling clinical translation of a novel activation-repolarisation time metric for improved identification of optimal catheter ablation sites”

French Embassy Collaborative Science & Technology workshop
£3.3K, Start date 24/11/2016, End date 01/09/2017
“PHOOD: bringing together pharma and food through sensory science towards health and wellness”

BHF Clinical Research Fellowship (Ref: 41376) PI: Dr Pier Lambiase, Fellow: Neil Srinivasan
£196k, Start date: 01/02/2014, Duration: 3 years.
“Mechanisms of T wave Generation and the Identification of Dynamic ECG Biomarkers…”

MRC CASE Studentship with Boston Scientific Ltd. (Ref: MR/L015161/1) PI: Dr Pier Lambiase
£99k, Start date: 01/10/2014, Duration: 4 years.
“Investigation of dynamic absolute refractory period pacing in the prevention of lethal arrhythmias…”

MRC Project Grant (Ref G0901819) PI: Dr Pier Lambiase, UCL Heart Hospital.
£950k, Start date: 15/11/2010, Duration: 3 years
“An interactive in vivo and molecular investigation …mechanisms of sudden cardiac death”

Royal Society / Wolfson Biomedical Laboratory Refurbishment Grant, PI: Prof M Edirisinghe
£238k, Funding Dates 01-Apr-07 to 31-Mar-08.

Industrially-funded Consultancy and Research:

Approximately 20 contracts in previous 3 years

Academic Supervision

PhD Primary Supervisor:
5 x PhDs awarded, 1 x MPhil awarded.

PhD Secondary Supervisor:
3 x PhD awarded, 2 currently registered.

Postdoctoral Research Assistant Supervision:
5x postdocs for total of 5 years.

Most Cited Publications

Citation count (n) August 2020. For complete list see Google Scholar report or my UCL IRIS research page.

1. Steele, Catriona M; Alsanei, Woroud Abdulrahman; Ayanikalath, Sona; …Hanson, Ben; The influence of food texture and liquid consistency modification on swallowing physiology and function: a systematic review. *Dysphagia* 30:1 pp. 46054, 2015. (273)
2. Cichero, Julie AY; Lam, Peter; Steele, Catriona M; Hanson, Ben; Chen, Jianshe; Dantas, Roberto O; Duivestein, Janice; Kayashita, Jun; Lecko, Caroline; Murray, Joseph; Development of international terminology and definitions for texture-modified foods and thickened fluids used in dysphagia management: the IDDSI framework. *Dysphagia* 32:2 pp. 293-314, 2017. (202)
3. Di Simplicio, M; Costoloni, G; Western, D; Hanson, B; Taggart, P; Harmer, CJ; Decreased heart rate variability during emotion regulation in subjects at risk for psychopathology. *Psychological medicine* 42:8 pp. 1775, 2012. (80)
4. O'Leary, Mark; Hanson, Ben; Smith, Christina; Viscosity and non-Newtonian features of thickened fluids used for dysphagia therapy. *Journal of Food Science* 75:6 pp. E330-E338, 2010. (69)
5. Hanson, Ben; Levesley, Martin; Self-sensing applications for electromagnetic actuators. *Sensors and Actuators A: Physical* 116:2 pp. 345-351, 2004. (64)
6. Hanson, Ben; Culmer, Peter; Gallagher, Justin; Page, Kate; Read, Elizabeth; Weightman, Andrew; Levesley, Martin; ReLOAD: Real laboratories operated at a distance. *IEEE Transactions on Learning Technologies* 2:4 pp. 331-341, 2009. (60)