

EDUCATION

Technical University, Eindhoven, the Netherlands (Faculty of Physics)
Degree: MSc (March 26, 1971)

University of Utrecht, the Netherlands (Faculty of Medicine)
Degree: PhD (November 20, 1984)

POSITIONS

1971-1983: Biomedical Engineer, Department of Physiological Signal Processing (head: prof. Jan H. van Bommel, PhD), Institute of Medical Physics TNO, Utrecht, NL

1984-1985: Biomedical Engineer, Biomedical Instrumentation Unit TNO (head: prof. Karel H. Wesseling), Amsterdam Medical Center, Amsterdam, NL

1986-present: Senior Researcher / Associate Professor, Cardiology Department (head: prof. Martin J. Schalij; head till 2010: prof. Ernst E. van der Wall, MD; head till 2000: prof. Albert V.G. Brusckhe, MD), Leiden University Medical Center, Leiden, NL

2017-present: Course Director, Biomedical Engineering Master's Degree Course "Physiological Signal Processing and Modelling in Cardiology", Faculty of Engineering, Università Politecnica delle Marche, Ancona, IT

AREAS OF EXPERTISE and PRIMARY INTERESTS

Teaching and Research Interests

- Electrocardiography/Vectorcardiography: Arrhythmia Prediction, Ischemia
- Neurocardiology: Syncope, Exercise Training & Rehabilitation, Music
- Cardiovascular Physiology, especially Electrocardiology, Electrophysiology and Arrhythmias, Syncope, Baroreflex and Blood Pressure Control, Physical Exercise, Training and Rehabilitation, Neurocardiology
- Computerized physiological signal processing and modelling of physiological processes related to the cardiovascular system
- Psychometrics

MAJOR ACTIVITIES

Teaching

- Course Director, "Physiological Signal Processing and Modelling in Cardiology" (Biomedical Engineering Master's Degree Course, Faculty of Engineering, Università Politecnica delle Marche, Ancona, IT)
- Course director "Heart and Circulation" (Medicine, 1st year)
- Course director "Physiology Basic Concepts" (Biomedical Sciences, 2nd year)
- Course director "Transient Loss of Consciousness" (Electives, Medicine, 2nd and 3rd year)
- Course director "Medicine for High School Students" (Tele-education)
- Lectures in various courses in Medicine, Biomedical Sciences and Biopharmacy
- Secretary of the "Student Education Committee" (Cardiology)
- Coordinator of the weekly scientific meetings (Cardiology)
- Member of the "Scientific Traineeship Committee" (Medicine)
- Chairman of the "Exam Quality Control Committee" (Medicine)
- Member of the "Exam Quality Control Committee" (Biomedical Sciences)

Patient care

- Evaluation of orthostasis (head-up tilt tests) in patients with syncope of unknown origin

Research

- Assessment of ventricular electrical heterogeneity (depolarisation heterogeneity, repolarisation heterogeneity, action potential duration heterogeneity) in the electrocardiogram
- Deep learning in serial ECG analysis
- Electrocardiography and vectorcardiography, various subjects, including modelling and development of research oriented signal processing software
- Measurement and interpretation of baroreflex sensitivity and heart rate variability
- Mechanism of action of biventricular pacing in heart failure
- Mechanism of autonomic improvement by rehabilitation of heart failure patients
- Neurocardiological consequences of active music making
- T-wave alternans and other electrocardiographic predictors of lethal cardiac arrhythmias

Software development

- A system for interactive real-time coronary care unit ECG monitoring (Fortran)
- CENSOR: a system for long-term off-line ECG analysis (Holter monitoring) (Fortran)
- LEADS: a system for vectorcardiography based analysis of standard 12-lead ECGs (Matlab)
- BEATS: a system for vectorcardiography based dynamic analysis (Matlab)
- TABULA: a set of C++ routines for general & statistical spreadsheet manipulation
- SIGNUM: a set of C++ routines for manipulation signals in spreadsheet format
- A model of baroreflex blood pressure control (Simulink)

PROFESSIONAL SERVICE

International Society for Computerized Electrocardiology

Co-Chair 2018 Meeting, Program Chair 2019 Meeting

Journal of Electrocardiology

Executive Editor

Leiden Foundation for ECG Analysis SEAL

Chairman, 1995-2002

Reviewer

Acta Physiologica

American Heart Journal

American Journal of Cardiology

American Journal of Physiology

Applied Biochemistry and Biotechnology

Biocybernetics and Biomedical Engineering

Biomedical Signal Processing and Control

BMC Cardiovascular Disorders

British Medical Journal

Brain and Behavior

Canadian Journal of Physiology and Pharmacology

Clinical Autonomic Research

Clinical Interventions in Aging

Clinical Rehabilitation

Computer Methods and Programs in Biomedicine

Computing in Cardiology

Current Medical Research and Opinion

European Society of Cardiology

Heart

Heart Rhythm

IEEE Transactions on Biomedical Engineering

International Archives of Occupational and Environmental Health

International Journal of Cardiology

International Journal of Telemedicine and Applications

Journal of Applied Physiology

Journal of Cardiovascular Development and Disease

Journal of Cardiovascular Electrophysiology

Journal of Clinical Medicine

Journal of Electrocardiology
Journal of Physiology (The)
Journal of the American College of Cardiology – Clinical Electrophysiology
Medicina
Netherlands Heart Journal
Netherlands Heart Foundation
Pacing and Clinical Electrophysiology
PeerJ
Physiological Measurement
Physiological Research
Renal Failure
Research Letters in Signal Processing
The Lancet

GRANTS (Netherlands Heart Foundation)

NHS 1989.110
NHS 1990.090
NHS 1993.43.032
NHS 2001.177
NHS 2003.B094
NHS 2009.B097

SOCIETIES

Netherlands Society of Cardiology
Netherlands Heart Rhythm Association
European Society of Cardiology
European Society of Cardiology Working Group on e-Cardiology
Netherlands Society for Biophysics and Biomedical Technology

TRAINEES

(Leiden University, if not otherwise stated)

PhD thesis

C. Cato ter Haar (Medicine, 2020)
Agnese Sbröllini (Università Politecnica delle Marche, Ancona, IT; for the deep learning project, 2019)
Vivian P. Kamphuis (for the ECG-related subjects, Medicine, 2019)
Sum-Che Man (Medicine, 2016)
Stephanie Hillebrand (Medicine, 2015)
Maaïke G.J. Gademan (Medicine, 2009)

Bart Hooft van Huysduynen (Medicine, 2006)
Joost Frederiks (Medicine, 2001)
Marianne Bootsma (Medicine, 1995)
Marc J.A. Janssen (Medicine, 1993)

Master Thesis

Fatma Al-Sofi (Medicine, 2019)
Masih Amini (Medicine, 2019)
Krizia Ciccetti (Università Politecnica delle Marche, Ancona, IT, 2018)
Hugo Quaak (Medicine, 2018)
Jeanet de Raaf (Medicine, 2018)
Nicole Rijnsburger (Medicine, 2018)
Friso van Bokhorst (Medicine, 2017)
Pierre A.F.M. Grosveld (Medicine, 2017)
Marjolein C. De Jongh (Medicine, 2015)
Vivian P. Kamphuis (Medicine, 2012)
Cornelia C. ter Haar (Medicine, 2012)
Teunis Schuurman (Mechanical Engineering, Technical University of Delft, 2011)
Priscilla V. de Winter (Medicine, 2011)
Elena van den Akker (Medicine, 2010)
Sum-Che Man (Biomedical Sciences, 2007)
Harmen H.M. Draisma (Biomedical Sciences, 2005)
Hedde van de Vooren (Physics, 2004)
Annelies L.S. Schoneveld (Medicine, 2003)
Vanessa J. Valk (Medicine, 2003)
Maura Santunione (Bioengineering, University of Bologna, I, 2002)
Rosalie M.M. Kemps (Medicine, 2002)
Adriaan O. Kraaieveld (Medicine, 2002)
Natasha Dijkstra (Medicine, 2002)
Diana C.G. de Veld (Physics, 1998)
Anwar Ghafoerkhan (Medicine, 1998)
J.M.M. (Hanneke) Veldhuizen (Medicine, 1997)
Caroline A.H. Pfeiffer (Medicine, 1997)
Jeroen V. Levert (Medicine, 1997)
Mona Mazgani (Medicine, 1994)
Harm H. van Bolhuis (Biomedical Sciences, 1993)
Henriëtte ter Heide (Medicine, 1990)
Jan C. Looyen (Electronics, Eindhoven University of Technology, 1973)
Mart Hermans (Physics, Eindhoven University of Technology, 1972)

Bachelor level

Roderick W Treskes (Medicine, 2014)
Berbel B. L. M. IJkema (Medicine, 2013)
Chinar Rahmattulla (Medicine, 2011)
Annemijn M. Algra (Medicine, 2010)
Charlotte A. Schreurs (Medicine, 2010)
E.H. (Eunhyo) Kim (Biomedical Sciences, 2007)
M. Louisa Antoni (Medicine, 2004)
Omar Turhan (Informatics, The Hague University, 1995)
Ronald Baljeu (Informatics, The Hague University, 1993)
C. (Kees) Brobbel (Informatics, The Hague University, 1989)
Dick Hordijk (Electronics, Rotterdam University, 1973)

Pre-university College, Leiden University

Louise I. Burggraaf (2012)
T. (Dorine) W. Elffers (2012)
Floor M. Segeth (2012)
Femke M.C. Austie (2012)
Mariëlle B. Plug (2012)