

research statement and curriculum vitae

The sources of bio-electromagnetic activity lie at the core of my scientific interest. My activities center around identification and localization of these sources. Currently

the focus is on the generators of spontaneous and evoked epileptic activity in the brain. My main drive is to turn advanced signal processing techniques and physical models into practical methods that improve diagnosis.

I obtained my master's degree in experimental physics in the bioelectricity group of Dr. Adriaan van Oosterom from the department of medical physics and biophysics at the University of Nijmegen. After my graduation in 1985 I started working as a PhD student on the inverse problem of electrocardiography. This established my expertise in solution methods for bioelectric ill-posed inverse problems. Following my doctorate in 1989 I continued working on inverse modeling of cardiac electrical sources as a postdoc, both in Nijmegen and at the University of California at Irvine, in collaboration with Dr. Fred Greensite of the department of radiological sciences. During my last postdoc period in Nijmegen I developed an interest in computational model simulation, in this case for the genesis and propagation of electrical activity in the cardiac muscle. With this expertise and interest I moved to Utrecht in 1996. There I introduced research in advanced inverse modeling of the sources of EEG and MEG, and later also combined EEG-fMRI recordings, in the presurgical evaluation of epilepsy patients. This led to publications that are influential in a field that then was not yet fully developed. Currently the methods that are based on this research are clinically used in our group, for the epilepsy patients in which a diagnosis favorable for surgical cure is hard to obtain.

As staff physicist at the department of clinical neurophysiology I gradually became involved in the invasive electrophysiological measurements that are performed in some epilepsy surgery candidates. This turned my research focus gradually more towards signal processing, in particular in the advanced analysis of spontaneous epileptiform activity and activity evoked by electrical stimulation of the cortex. This has also revived my earlier interest in computational model simulation. Brain stimulation and its effect on cortical activity is a rapidly developing field, and I am contributing to it in a number of publications. The challenge now is, again, to develop the research methods into practical clinical tools that can be used non-invasively in presurgical evaluation, or in the operating theater during epilepsy surgery.

Key publications

Interictal electromagnetic source imaging in focal epilepsy: Practices, results and recommendations

Leijten, F. S. S. & Huiskamp, G. J. M., 1 Aug 2008, In: *Current Opinion in Neurology*. 21, 4, p. 437-445 9 p.

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Identification of the epileptogenic tuber in patients with tuberous sclerosis: A comparison of high-resolution EEG and MEG

Jansen, F. E., Huiskamp, G. J. M., van Huffelen, A. C., Bourez - Swart, M. D., Boere, E., Gebbink, T., Vincken, K. L. & van Nieuwenhuizen, O., Jan 2006, In: *Epilepsia*. 47, 1, p. 108-114 7 p.

Research output: [Contribution to journal](#) > [Article](#) > [Academic](#) > [peer-review](#)

Modality-specific spike identification in simultaneous magnetoencephalography/electroencephalography: A methodological approach

Zijlmans, M., Huiskamp, G. M., Leijten, F. S. S., Van der Meij, W. M., Wieneke, G. & Van Huffelen, A. C., 1 Dec 2002, In: *Journal of Clinical Neurophysiology*. 19, 3, p. 183-191 9 p.

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Inverse modeling in magnetic source imaging: Comparison of MUSIC, SAM(g2), and sLORETA to interictal intracranial EEG

Gooijer-van de Groep, K. L., Leijten, F. S. S., Ferrier, C. H. & Huiskamp, G. J. M., Sept 2013, In: *Human Brain Mapping*. 34, 9, p. 2032-2044 13 p.

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Multimodal Source Imaging: Basic Methods, Signal Processing Techniques, and Applications

Huiskamp, G., Oostendorp, T. F. & De Munck, J. C., Dec 2016, In: *IEEE Transactions on Biomedical Engineering*. 63, 12, p. 2550-2551 2 p.

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Electrocorticographic language mapping with a listening task consisting of alternating speech and music phrases

Mooij, A. H., Huiskamp, G. J. M., Gosselaar, P. H. & Ferrier, C. H., 1 Feb 2016, In: *Clinical Neurophysiology*. 127, 2, p. 1113-1119 7 p.

Research output: [Contribution to journal](#) > [Article](#) > [Academic](#) > [peer-review](#)

Time-frequency analysis of single pulse electrical stimulation to assist delineation of epileptogenic cortex

van 't Klooster, M. A., Zijlmans, G. J. M., Leijten, F. S. S., Ferrier, C. H., van Putten, M. J. & Huiskamp, G. J. M., Oct 2011, In: Brain. 134, 10, p. 2855-2866 12 p.

Research output: Contribution to journal › Article › Academic › peer-review

Interictal magnetoencephalography and the irritative zone in the electrocorticogram

Agirre-Arrizubieta, Z., Huiskamp, G. J. M., Ferrier, C. H., van Huffelen, A. C. & Leijten, F. S. S., Nov 2009, In: Brain. 132, 11, p. 3060-3071 12 p.

Research output: Contribution to journal › Article › Academic › peer-review

EEG-fMRI in the preoperative work-up for epilepsy surgery

Zijlmans, G. J. M., Huiskamp, G. J. M., Hersevoort, M., Seppenwoolde, J. H., van Huffelen, A. C. & Leijten, F. S. S., Sept 2007, In: Brain. 130, (Pt-9), p. 2343-2353 11 p.

Research output: Contribution to journal › Article › Academic › peer-review

Measurement of the conductivity of skull, temporarily removed during epilepsy surgery

Hoekema, R., Wieneke, G. H., Leijten, F. S. S., van Veelen, C. W. M., van Rijen, P. C., Huiskamp, G. J. M., Ansems, J. & van Huffelen, A. C., 2003, In: Brain Topography. 16, 1, p. 29-38 10 p.

Research output: Contribution to journal › Article › Academic › peer-review

Simulation of depolarization in a membrane-equations-based model of the anisotropic ventricle

Huiskamp, G., Jul 1998, In: IEEE Transactions on Biomedical Engineering. 45, 7, p. 847-855 9 p.

Research output: Contribution to journal › Article › Academic › peer-review

A new method for myocardial activation imaging

Huiskamp, G. & Greensite, F., Jun 1997, In: IEEE Transactions on Biomedical Engineering. 44, 6, p. 433-446 14 p.

Research output: Contribution to journal › Article › Academic › peer-review

DIFFERENCE FORMULAS FOR THE SURFACE LAPLACIAN ON A TRIANGULATED SURFACE

HUISKAMP, G., Aug 1991, In: Journal of computational physics. 95, 2, p. 477-496 20 p.

Research output: Contribution to journal › Article › Academic › peer-review

THE MAGNETOCARDIOGRAM AS DERIVED FROM ELECTROCARDIOGRAPHIC DATA

VANOOSTEROM, A., OOSTENDORP, TF., HUISKAMP, GJ., TERBRAKE, HJM. & Huiskamp, G., Dec 1990, In: Circulation Research. 67, 6, p. 1503-1509 7 p.

Research output: Contribution to journal › Article › Academic › peer-review

THE DEPOLARIZATION SEQUENCE OF THE HUMAN-HEART SURFACE COMPUTED FROM MEASURED BODY-SURFACE POTENTIALS

HUISKAMP, G. & VANOOSTEROM, A., Dec 1988, In: IEEE Transactions on Biomedical Engineering. 35, 12, p. 1047-1058 12 p.

Research output: Contribution to journal › Article › Academic › peer-review