

# Biomedical Engineering

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## Core Faculty Profile

### Alan V. Sahakian

Professor, Bette and Neison Harris Professor of Teaching Excellence,  
Joint appointment with Electrical Engineering and Computer Science  
PhD, Electrical Engineering, University of Wisconsin

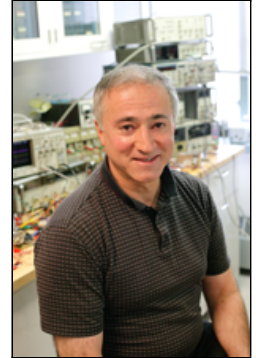
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Alan V. Sahakian

## Research Interests

Cardiac electrophysiology (especially atrial fibrillation and its treatment by automatic implanted devices), Diagnostic instrumentation for medical and aerospace applications.

## Selected Publications

1. H. al Angari and A.V. Sahakian, *Use of Sample Entropy Approach to Study Heart Rate Variability in Obstructive Sleep Apnea Syndrome*, TO APPEAR IN IEEE Transactions on Biomedical Engineering, 2007.
2. S. Petrutiu, A.V. Sahakian and S. Swiryn, *Short-Term Dynamics in Fibrillatory Wave Characteristics at the Onset of Paroxysmal Atrial Fibrillation in Humans*, TO APPEAR in The Journal of Electrocardiology, 2007.
3. M. Ruffolo, M.S. Daskin, A.V. Sahakian and R. Berry, *Design of a Large Network for Radiological Image Data*, IEEE Transactions on Information Technology in Biomedicine, 11(1) pp. 25-39, 2007.
4. A. Heifetz, K. Huang, A.V. Sahakian, X. Li, A. Taflove and V. Backman, *Experimental Confirmation of Backscattering Enhancement Induced by a Photonic Jet*, Applied Physics Letters, 89(221118), pp. 2006.
5. S. Petrutiu, J. Ng, G. M. Nijm, H. al-Angari, S. Swiryn and A.V. Sahakian, *Atrial fibrillation and waveform characterization in the surface ECG a time domain perspective, (Invited Paper)*, IEEE EMBS Magazine, 25(6) pp. 24-30, Nov.2006.
6. J. Ng, A.V. Sahakian, W.G. Fisher and S. Swiryn, *Atrial Flutter Loops Derived from the Surface ECG: Does the Plane of the Loop Correspond Anatomically to the Macro-reentrant Circuit*, The Journal of Electrocardiology, 2005.
7. Q. Xi, A.V. Sahakian, T.G. Frohlich, J. Ng, S. Swiryn, *The relationship between the pattern of occurrence of atrial fibrillation and surface ECG fibrillatory wave characteristics*, Heart Rhythm, 1, pp. 656-663, 2004.
8. J. Ng, A.V. Sahakian, W.G. Fisher and S. Swiryn, *Surface ECG vector characteristics of organized and disorganized atrial activity during atrial fibrillation*, Journal of Electrocardiology, 37(supplement), pp. 91-97, 2004.
9. Q. Xi, A.V. Sahakian, J. Ng, and S. Swiryn, *Atrial fibrillatory wave characteristics in the surface electrocardiogram: consistency over twenty-four hours in clinically stable patients*, Journal of Cardiovascular Electrophysiology, 15(8), pp. 1-7, August 2004.
10. J. Ng, A.V. Sahakian and S. Swiryn, *Accelerometer-Based Body-Position Sensing for Ambulatory Electrocardiographic Monitoring*, Biomedical Instrumentation and Technology, 37(5), pp. 338-346, 2003.
11. Q. Xi, A.V. Sahakian and S. Swiryn, *The effect of QRS cancellation on atrial fibrillatory wave signal characteristics in the surface electrocardiogram*, The Journal of

Electrocardiology, 36(3), pp. 243-249, 2003.

12. A.V. Sahakian, M.-S. Lee-Peterson, S. Shkurovich, M. Hamer, T. Votapka, T. Ji and S. Swiryn, *A simultaneous multichannel monophasic action potential electrode array for in vivo epicardial repolarization mapping*, IEEE Transactions on Biomedical Engineering, 48(3), pp. 345-353, 2001.
13. S.M. Shors, A.V. Sahakian, H.J. Sih and S. Swiryn, *"A method for determining high-resolution activation time delays in cardiac mapping,"* TO APPEAR in the IEEE Transactions on Biomedical Engineering, December, 1996.
14. A.T. Schoenwald, A.V. Sahakian and S. Swiryn, *"Detecting atrial fibrillation using spatial precision,"* IEEE EMBS Magazine (invited) Vol. 15(3), pp. 45-51, 1996.
15. C.L. Chan, A.K. Katsaggelos and A.V. Sahakian, *"Linear-quadratic noise-smoothing filters for quantum-limited images,"* IEEE Transactions on Image Processing, IEEE Trans. Image Processing, 4(9), pp. 1328-1333, 1995.
16. H.J. Sih, A.V. Sahakian, C.E. Arentzen and S. Swiryn, *"A frequency domain analysis of epicardial maps,"* IEEE Transactions on Biomedical Engineering, 42(7), pp. 718-727, 1995.

## Honors & Awards

- Fellow of the IEEE with the citation: "for contributions to electrophysiology of atrial cardiac arrhythmias"

For additional information, visit <http://www.ece.northwestern.edu/~sahakian/>



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