TreMonti

PET Based Voxel-Resolution Myocardial Blood Flow Analysis

Measurement of blood flow to assess cardiovascular health

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Inventors
John M Anderson, Ph.D.

Field
Medical Imaging,
Cardiovascular diagnostics

Technology
Algorithm for measuring absolute myocardial blood flow (MBF) via PET dynamic scans

Key Features
- Quantitatively estimates myocardial blood flow
- Improves modeling of the flow of radiotracers in the heart
- Improves assessment of cardiovascular health

Stage of Development
Prototype developed and tested

Status
Seeking either a PET scanner manufacturer or a software distributor as a partner (note: HU has a licensing agreement with Emory that you should be able to consult)

Patent Status
Patent pending

Technology

This invention is an enhanced factor analysis of dynamic systems (FADS) method for estimating myocardial blood flow for each voxel in the myocardium. The algorithm can measure absolute myocardial blood flow (MBF) quantitatively. A pharmacological kinetics model and a "voxel" (volumetric pixel) myocardial blood flow model for measurement of flow through each voxel in the myocardium can be used together to measure the total flow. This algorithm improves current methods by better modeling the flow of radiotracers through the heart and calculating flow through each individual voxel. Positron Emission Tomography (PET) scanning is the imaging modality used to collect data. Doctors can use the algorithm with a PET scanner to measure flow through the heart to detect early stage coronary artery disease (CAD), since lower rates of myocardial blood flow are associated with CAD.

Potential Application

A commercial product incorporating this invention could be a PET scanner that uses this algorithm as part of its software package, or the software could be sold separately and used to analyze data collected from dynamic PET scans. Absolute measurement of MBF is known to be highly useful for clinical predictive purposes. Physicians could use the results from this algorithm to assess the vascular health of a patient and prescribe medications, surgery, and/or lifestyle changes based on MBF measurements.

Opportunity

There are 370 facilities in the US using PET imaging, and approximately 3 million PET scans were performed in the US in 2010. The global market for post processing medical imaging software is expected to be $1.3 billion in 2014 by growing at an annual rate of 11%. This technology could be integrated in any facility with a PET scan system installed.

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INVENTOR:
John M.M. Anderson, Ph.D.
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EDUCATION
Ph.D., Electrical Engineering, University of Virginia, 1992
M.S., Electrical Engineering, Georgia Institute of Technology, 1987

SPECIALTY
Image Processing and Statistical Signal Processing

RECENT PUBLICATIONS

J. M. M. Anderson, A. D. Jackson, H. Martin, G. Shubert, ``Non-Destructive Evaluation of Naval Munitions Using X-ray CT," Research in Non-Destructive Evaluation, vol. 22, pp. 16-30, January 2011.

J. M. M. Anderson, Y. Kim, and J. R. Votaw, ``Concurrent segmentation and estimation of transmission images for attenuation correction in positron emission tomography," IEEE Transactions on Nuclear Science, vol. 56, pp. 136-146, February 2009.

J.M.M. Anderson, ``A Generalized Likelihood Ratio Test for Detecting Anomalies Within Multispectral Images," IEEE Transactions on Geoscience and Remote Sensing, vol. 5, pp. 547-551, July 2008

J. Chang, J.M.M. Anderson, and B.A. Mair, "An Accelerated Penalized Maximum Likelihood Algorithm for Position Emission Tomography,'' IEEE Transactions on Nuclear Science, vol. 54, pp. 1648-1659, October 2007.

J. M.M. Anderson, R. Srinivasan, B. A. Mair, and J. R. Votaw, ``Accelerated penalized weighted least-squares and maximum likelihood algorithm for reconstructing transmission images from PET transmission data," IEEE Transaction on Medical Imaging, vol. 24, pp. 326-337, March 2005.

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RECENT PUBLICATIONS (continue)

J. Chang, J.M.M. Anderson, J. R. Votaw ``Regularized image reconstruction
algorithms for positron emission tomography,"
IEEE Transactions on Medical Imaging, vol. 23,
pp. 1165-1175, September 2004.

H. Lu, Y. Kim, and J.M.M. Anderson,
``Improved Poisson intensity estimation: Denoising
application using Poisson data,"
IEEE Transactions on Image Processing, vol. 13,
pp. 1128-1135, August 2004.