

GRANT T. GULLBERG

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SUMMARY

Senior scientist with extensive experience developing and directing basic scientific research, and implementing and administering product development on a broad range of cutting edge mathematical applications in medical imaging. Effective listener, sincere, and enthusiastic. Mentored and worked with students and other scientists of all ages, and have developed ongoing collaborations across research fields that encourage others to extend their horizons to include new possibilities.

PROFESSIONAL EXPERIENCE

LAWRENCE BERKELEY NATIONAL LABORATORY (LBNL) **2002-2015**
Senior Scientist, Life Science Division, Structural Biology and Imaging Department

UNIVERSITY OF CALIFORNIA SAN FRANCISCO **2003-present**
Adjunct Professor, Radiology

Key competencies:

- Secured \$21 million in research funds from government and industrial sources.
- Directed a thriving medical imaging research lab of 35 personnel including seven faculty.
- Collaborated nationally and internationally training students and Post Docs in the physics and mathematics of medical imaging.
- Developed models of the physics for imaging of biochemical and mechanical properties of biological organs, resulting in commercialization.
- Solved mathematics of inverse problems including tensor tomography and statistical estimation theory.
- Coded image reconstruction algorithms using optimization theory with convex analysis and duality.
- Installed software in Machine language for fast tomographic image reconstruction on a commercial SPECT system.
- Designed instrumentation for radionuclide imaging, achieving the first commercial simultaneous transmission/emission SPECT system.
- Patented the design of a hardwired projector/backprojector.
- Organized and taught four graduate courses in the physics and mathematics of nuclear and magnetic resonance imaging.
- Published 197 scientific papers in peer reviewed journals.
- Presented 96 invited lectures on medical imaging research.

Directed scientific research. Directed a medical image research lab at the University of Utah consisting of 35 personnel that included scientists, engineers, secretaries, students, postdocs, and seven faculty. Managed three cardiac imaging research projects funded by NIH at LBNL involving five LBNL personnel; 14 scientists from seven other universities: UCSF (4), University of Utah (1), University of Washington (1), Johns Hopkins University (4), Duke University (1), Florida Institute of Technology (1) and University of Tuebingen (2); as well as 13 consultants from 13 institutions.

Performed research in cardiac perfusion, metabolism, mechanics, and electrophysiology. Developed compartment models of biochemical processes, FE mechanical models of cardiac deformation, and cardiac electrophysiological models to support the study of the relationship between cardiac perfusion, metabolism, and function through the imaging of tracer kinetics, structure, mechanical deformation, and electromagnetism associated with cardiac function.

Solved inverse problems with application to medicine and biology. Created image reconstruction algorithms for SPECT including projector/backprojectors for parallel- and converging-beam geometries that model attenuation, scatter, and detector response; and algorithms for optimizing least squares and Bayesian objective functions with constraints using principals of duality. Directed the reconstruction of time activity curves and kinetic model parameters directly from dynamic SPECT projection tomographic measurements, and the reconstruction of tensor fields of in vivo diffusion properties of tissue using MRI. Identified future applications of x-ray phase contrast CT, ultrasound, and magnetocardiography (MCG) to form in vivo images of dynamic processes in biology and medicine.

EDUCATION

Ph.D., Biophysics, University of California, Berkeley, California
M.S., Mathematics, University of Washington, Seattle, Washington
B.S., Mathematics, Seattle Pacific University, Seattle, Washington

HONORS

Editorial Board, Journal of Nuclear Cardiology
Associate Editor, IEEE Transactions on Medical Imaging
International Advisory Board, Physics in Medicine and Biology
Medical Imaging Conference Chairman, IEEE Nuclear Science Symposium and Medical Imaging Conference, Seattle, Washington
Fellow, IEEE
SNM Computer and Instrumentation Council's Ed Hoffman Memorial Award