

Jon D. Treffert

Work History

Nov 1, 2023 - present Treffert Innovations LLC Powell, TN

Owner

Open to new opportunities

Feb 1, 2019 – Oct 31, 2024 RaySearch Americas

Functionality Owner – Treatment Drivers

Leading US-based team developing Treatment Machine interfaces to expand the number of radiation therapy delivery systems with which the RayCare Oncology Information System can manage treatment. Our mission is also to provide extension to online adaptive delivery leveraging the strength of the RayStation treatment planning system.

Represent RaySearch as Vendor Co-Chair of the IHE-RO Technical Committee which maintains and advances standards for interoperability of systems in the Radiation Oncology Domain.

Principal Software Developer

Provided technical leadership for development of a new Treatment Session Manager product – following a Discrete Positioning and Delivery Workflow (DPDW) profile of the Integrating the Health Enterprise – Radiation Oncology (IHE-RO) – initially for use with the AVO Linear Accelerator for Imaging Guided Hadron Therapy (LIGHT). System was later employed to replace existing infrastructure at the MedAustron Particle Therapy Center in Wiener Neustadt, Austria. First patients were treated with this system at MedAustron in April 2022.

Feb 9, 2018-Feb 1, 2019 Treffert Innovations LLC Powell, TN

Owner

Provided medical device software services to clients including:

ProNova Solutions
RaySearch Laboratories AB

on projects including:

- Implementation of 2D/3D image registration in collaboration with MIM software
- Integration of the RayCare Oncology Information System with the SC360 proton therapy system including Treatment Delivery resulting in first patient proton treatment with this product

2012-Feb 9, 2018 ProNova Solutions Knoxville, TN

Director, Software Engineering

Led software development of SC360 Proton Therapy System – 510(k) approved in Dec 2016 including:

- Integration of medPhoton CBCT Imaging ring and Leoni Orion robotic couch
- Research collaboration on prototype development of in-beam imaging of PET/prompt gamma emission for in-vivo verification of dose delivery

2004-2012 Siemens Medical Systems, Molecular Imaging Knoxville, TN

Scientific Advisor

Developed Molecular Imaging Research Platform for development of advanced workflows for all fielded PET/CT and MR/PET platforms. Currently facilitating efforts of clinical partners in MR-derived motion correction and multi-gating for MR/PET.

Led development of PET/CT virtual endoscopy employed in first clinical evaluations of the technique in lung, head/neck and colon cancer. [Cited for SNM Press release, EANM 2011 presentation received Eckert-Ziegler award].

Provided technical leadership for development team responsible for bringing PET/CT cardiac evaluation software to product.

Senior Staff Scientist

Prototyped PET/CT cardiac evaluation software in collaboration with CT colleagues in Germany.

1994-2004 CTI PET Systems, Inc. Knoxville, TN

Manager, Computer Engineering

Prototyped, defined system architecture and led development for first commercial combined PET/CT scanner computer systems (acquisition and processing) based on Siemens *syngo* framework. Ported CAPP/IDL environment to Windows NT and integrated into *syngo*.

Led development team which extended functionality of the Clinical Applications Programming Package (CAPP) to include optimized acquisition, reconstruction and post-acquisition image processing of clinical whole-body PET oncology studies.

Facilitated development of clinical PET and SPECT CAPP applications at domestic and European customer sites.

Senior Scientist

Led development of IDL-based Clinical Applications Programming Package on which ECAT Version 7.0 PET image processing software is based.

1987-1994 Siemens Medical System, Nuclear Medicine Group
Hoffman
Estates IL

Staff Scientist

Investigated automated, optimal processing of nuclear medicine studies.

Primary focus on the application of knowledge-based factor analysis to gated cardiac and dynamic SPECT and PET image sequences.

Participated in Siemens Quality Improvement Process. Recognized with Company Quality Award

Senior Principal Research Scientist

Led effort to develop methods for automated knowledge-directed acquisition and processing of nuclear medicine images.

Principal Research Scientist

Participated in project to achieve scatter reduction in nuclear medicine images using energy-weighted acquisition with finite spatial filters.

Investigated reconstruction of PET and SPECT images using constrained linear estimation in a PSRF representation.

1979-1987 University of Wisconsin Madison WI

Research Assistant, Electrical and Computer Engineering

Conducted plasma physics research with the Torsatron/Stellarator Laboratory
Assisted on the following projects:

1. Design and construction of the hydrogen occluded titanium washer gun used to produce plasma in the Proto-Cleo Stellarator.
2. Design and construction of a Fabry-Perot interferometer used to measure ion temperature in the Proto-Cleo Stellarator.
3. Investigation of carbon impurity spectra in Proto-Cleo using a monochromometer.

Ph.D. project involved the determination of the plasma current distribution in Proto-Cleo. Designed and constructed to devices to in Ph.D. research including:

1. Local plasma current diagnostics: a small (active area 0.5 mm) saturation paddle probe, and a small (i.d. 5 mm, o.d. 7 mm main coil 2400 turns) Rogowski coil.
2. Analog instrumentation for current probes including a wide CMRR range, high frequency CMRR amplifier and a low noise, high gain auto-zeroing integrating preamplifier. Both devices were used to amplify probe signals in a high noise environment. The Rogowski coil circuitry incorporated a feedback system to actively remove pickup due to coil winding errors.

Obtained the first direct evidence of the existence of Pfirsch-Schlueter and bootstrap currents in stellarators.

Used tools developed for thesis research to assist in the development of a model for ECH stochastic heating in fully 3-D magnetic configurations.

1985 **Kharkov Physico-Technical Institute** **Kharkov, Ukraine**

Worked with staff of the Uragan 3 torsatron and Dr. Richard Colchin of the Oak Ridge National Laboratory determining accuracy of the alignment of the magnetic field coils of the device.

A 1 cm displacement of the helical coil axis, relative to the vertical field coil axis was discovered and has been subsequently corrected, providing an improvement in the plasma parameters of the Uragan 3 device. The methods were subsequently used to align the coil sets of the Advanced Toroidal Facility at O.R.N.L.

1980 **Max Planck Institut fuer Plasmaphysik** **Garching bei Muenchen, Germany**

Worked with the experimental staff of the Wendelstein VIIA stellarator.

Education/Skills

1975-1987

University of Wisconsin

Madison, WI

B.S. in Electrical Engineering in August 1979.
Graduated with Honors, graduated with Distinction. Member Eta Kappa Nu (electrical engineering honor society).

M.S. in Electrical Engineering in May 1981.

Thesis title:

Determination of Ion Temperature in the Proto-Cleo Stellarator
from Doppler Broadening of Spectral Lines.

Completed all degree requirements for Ph.D., pending completion of thesis, in Electrical Engineering.

At Raysearch, working with Microsoft C#.Net environment which provides Python script extensions. The organization employs Azure DevOps for Agile development.

At ProNova, implemented and utilized IBM's Collaborative Lifecycle Management suite (Jazz) for medical product (SC360 Proton Therapy System) development – including source code management and sprint planning and requirements, design and test management and tracing – including C#.NET, LabView and PLC code

Developed C#.NET Windows 7/8/10 components for proton therapy system including

DICOM Treatment Delivery Workflow
Treatment Plan editing

At Siemens developed cross-platform PET, PET/CT and PET/MR clinical image processing/visualization and instrument control software on

Sun, HP, SGI and DEC Unix systems using
C/C+, X/Xt/Motif and OpenGL APIs
IDL (4GL from Research Systems, Inc. Boulder CO)

Intel systems running Windows NT, XP using
Microsoft Visual C++ and MFC
IDL
Siemens *syngo* framework

Utilized Rational Software's Development Studio for UML-based object design/analysis

Publications

Journal Articles

Virtual 3D 18F-FDG PET/CT Panendoscopy for Assessment of the Upper Airways of Head and Neck Cancer Patients: A Feasibility Study (accepted May 6, 2012 for publication in Europ. J Nucl Med with Buchbender C, Heusner T, Antoch GA, Geiger B, Forsting M, Bockisch A, Lehnerdt G, Mattheis E)

Diagnostic accuracy of virtual 18F-FDG PET/CT bronchoscopy for the detection of lymph node metastases in non-small cell lung cancer patients. J Nucl Med. 2011 Oct;52(10):1520-5 (with Herbrink M, Geiger B, Riegger C, Hartung V, Rosenbaum-Krumme SJ, Forsting M, Antoch G, Heusner TA.)

Energy-Weighted Acquisition of Scintigraphic Images using Finite Spatial Filters. J. Nucl. Med. 30 (20), 2029 (1989) (with R.P. Devito, J.J. Hamill, and E.W. Stoub)

Magnetic field alignment studies for the URAGAN-3 torsatron, Rev. Sci. Instrum. 57 (7), 1233 (1986) (with R.J. Colchin, J.H. Harris, D.K. Lee, J.A. Rome, S.I. Fedotov, F.I. Ozherel'ev, O.S. Pavlichenko, D.P. Pogozhev, and V.M. Zalkind).

Measurement of Self Generated Pfirsch-Schlueter and Bootstrap Currents in the Proto-Cleo Stellarator, Phys. Rev. Letters 53, 2049 (1984) (with H.L. Berk and J.L. Shohet).*

Patent Applications

High Sensitivity SPECT Imaging of Small Body Organs using a Multi-head Scintillation Camera with Non-uniform Collimation, Ser. No. 08/054,804 filed April 27, 1993 (with P.C. Hawman, J. Qian)

Optimization of Parameters of Nuclear Medicine Studies before the Studies are completed, Ser. No. 07/765, 654 filed September 25, 1991

Selected Contributed Papers

First results with a couch-mounted Cone Beam Computed Tomography guidance device on a superconducting proton gantry

[Abstract] PTCOG 56 2016 (with D. Hu, D. Slater, H. Zandi, S. Pinault, M. Mehrwald, H. Deutschmann, P. Steininger, P. Jacob)*

Foundations for intratherapy PET in proton therapy [Presentation at Intraoperative and Intratherapy Molecular Imaging Workshop – Nov 3, 2013 in conjunction with the IEEE NSS/MIC) *

Diagnostic accuracy of virtual 3D FDG-PET/CT bronchoscopy for the detection of lymph node metastases in non small cell lung cancer patients [Abstract] EANM 2011 presentation received Eckhart Ziegler award (with T. A. Heusner, B. Geiger, M. Herbrich, A. Bockisch, G. Antoch)

Application and Interpretation of Principal Component Analysis of Gated Cardiac Images, [Abstract] J. Nucl. Med. 34, 175 (1993) (with R.E. Wendt III, P.H. Murphy, M.W. Groch, W.D. Erwin, P.M. Schneider, W.H. Moore)

Model-based Quantitation using Knowledge-based Factor Analysis, [Abstract] J. Nucl. Med. 33, 947 (1992) (with J.T. Yap, M.D. Cooper, and C.T. Chen)*

Quantitative Analysis of Dynamic Renal Studies using Factor Analysis, [Abstract] J. Nucl. Med. 33, 947 (1992) (with J.T. Yap, C.T. Chen, M.D.Cooper, M. Nathan and T. Brown)

Knowledge-based LV Detection and Automatic EF Calculation for Gated Blood Pool Studies [Abstract] J. Nucl. Med. 33, 932 (1992) (with J. Qian, M.W. Groch, and W.D. Erwin)

Scatter removal by pre- and post-processing techniques [Abstract]. Nucl. Med. 29, 988 (1988) (with R.P. Devito, J.J. Hamill, and R. Jaszczak)

* work on which I was first author