JUN LIAN, PhD, DABR

EDUCATION

Stanford University, Stanford, California
Postdoctoral Fellowship in Medical Physics, December 2003

Case Western Reserve University, Cleveland, Ohio
Ph.D., Biomedical Engineering, January 2002, (defended and completed August 2001)

Chinese Academy of Sciences, Beijing, P.R.China
M.S., Biophysics, July 1997

Tsinghua University, Beijing, P.R.China
B.S., Applied Physics, July 1994

BOARD CERTIFICATION

Therapeutic Radiological Physics by The American Board of Radiology, June 2006

CLINIC AND RESEARCH EXPERIENCE

Department of Radiation Oncology, The University of North Carolina, Chapel Hill, NC
Clinical Assistant Professor, January 2004 – present

Clinical duties:

- Linacs QA (monthly and annual).
- MLC/Compensator IMRT QA.
- MOSFET.
- IORT calibration and delivery.
- Radiosurgery QA and treatment.
- TBI calculation.
- Image registration.
- HDR planning, treatment and source calibration.
- CyberKnife planning, treatment and QA.
- Compensator, block and electron cutout making.
- CT on rails on line correction.
- Chart checking.
- Teletherapy (3D conformal and IMRT) planning.

Research and development projects:

- Dose accumulation of brachytherapy and external beam radiotherapy planning, (2007-, under progress)
- Comparison of three source localization methods of Nucletron HDR system, 2008
- Feasibility study of treating multiple tumors simultaneously with a 4-bank mMLC stereotactic radiosurgery system, 2008

- Implement CT based HDR, 2007
- Integration of deformable image registration and re-optimization in the adaptive therapy (2006-, under progress).
- Develop a hybrid radiosurgery system with four bank mMLC (Alayna) and BRW frame (Radionics), 2006
- Develop a method to consider the locations of the dose discrepancy into the IMRT QA pass-or-fail decision-making, 2006.
- Implement cerrobend compensator based intensity-modulated radiotherapy (IMRT), 2006.
- Implement tungsten compensator based intensity-modulated radiotherapy (IMRT), 2005.
- Test the integration of Acculeaf 4-bank microMLC with Siemens MLC control module, 2005.
- Compare inhomogeniety corrections in IMRT treatment planning systems (A Collaborative Study), 2005.
- Compare IMRT plan and delivery quality for 9 treatment planning systems (A Collaborative Study), 2005.

Department of Radiation Oncology, Stanford University, Stanford, California
Postdoctoral Fellow, Supervised by Dr. Lei Xing, October 2001– December 2003

- Develop IMRT optimization algorithm using statistical inference theory to include *a priori* knowledge (C/C++).
- Develop biological modeling based IMRT with the inclusion of parameter uncertainty (C/C++).
- Implement deformable registration algorithm for multi-modality image fusion (C/C++, Matlab).
- Implement MRSI guided IMRT with the inclusion of MRS fluctuation (C/C++).

Neural Engineering Center, Case Western Reserve University, Cleveland, Ohio
Whitaker Foundation Trainee, Supervised by Dr. Dominique M. Durand, September 97-August 2001

- Develop electric stimulation protocols for suppression of epileptiform activity (Labview).
- Implement nonlinear dynamic algorithm for seizure prediction and characterization (C/C++, Java).
- Study the synchrony mechanism and control the synchronization of neuronal activity.
- Design photon emission imaging experiments to study the propagation and control of epileptic activity.

AWARDS AND HONORS

- Principal Investigator, Department of Defense Postdoctoral Training Grant (DAMD17-03-1-0019) "Incorporating model parameter uncertainty into prostate IMRT treatment planning", 2003-2005
- Whitaker Foundation Fellowship, 1997-2000
- "Di Au" Graduates' thesis competition of Chinese Academy of Sciences, 2nd place, 1997
- Excellent Graduate Scholarship, Chinese Academy of Sciences, 1995

REVIEWER

Medical Physics, Journal of Clinical Medical Physics, Brain Research, Journal of Physiology and internal grant of The City University of New York

PUBLICATIONS

Ollila D., Klauber-DeMore N., Tesche L., Kuzmiak C., Pavic D., Goyal L., **Lian J.**, Chang S., Livasy C., Sartor C.I. Feasibility of breast preserving therapy with single fraction in situ radiotherapy delivered intraoperatively. Annals of Surgical Oncology 14(2): 660-9 (2007).

Lian J., Xing L., Hunjan S., Dumoulin C., Levin J., Lo A., Watkins R., Rohling K., Giaquinto R., Kim D., Spielman D. and Daniel B., Mapping of the prostate in 3T endorectal coil MR and CT images: a deformable registration and validation study. Medical Physics 31(11):3087-94 (2004).

Lian J., Cotrutz C. and Xing L., Incorporating model parameter uncertainty into inverse treatment planning. Medical Physics 31(9):2711-20 (2004).

Lian, J., Bikson, M., Shuai, J.W. and Durand, D.M., Control of phase synchronization of neuronal activity in the rat hippocampus. Journal of Neural Engineering 1: 46-54 (2004).

Lian J., Cotrutz C. and Xing L., Therapeutic treatment plan optimization with probability density-based dose prescription. Medical Physics 30 (4): 655-666 (2003).

Lian J., Spielman D., Cotrutz C., Hunjan S., Kim D., Adalsteinsson E., King C., Luxton G., Boyer A., Daniel B. and Xing L., Including metabolic uncertainty into proton MR spectroscopic imaging (MRSI)-guided inverse treatment planning. (Medical Physics, submission pending, available upon request).

Lian J., Bikson M., Sciortino C., Stacey W.C. and Durand D.M., Local suppression of epileptiform activity by electrical stimulation in rat hippocampus in vitro. J. of Physiology 547:427-434 (2003).

Lian, J., Bikson, M., Shuai, J.W. and Durand, D.M., Propagation of non-synaptic epileptiform activity across lesion in rat hippocampal slices. J. of Physiology 537(Pt 1):191-9 (2001).

Lian, J., Shuai, J.W. and Durand, D.M., Nonlinear dynamic properties of low calcium induced epileptiform activity. Brain Research 890:246-254 (2001).

Lian J., Liu L., Xia S.Z., Feng C.H., and Guo A.K., Dynamics of conditioned visual flight orientation in Drosophila. Progress in Natural Science 8:573-580 (1998).

Lian J., Chen D.M., Guo A.K., and Chen R.S., Some nonlinear methods in the biological experimental data analysis. Progress in Biochemistry and Biophysics 24:300-303 (1997).

Shuai, J., Bikson, M., Hahn, P. J., **Lian, J.** and Durand, D. M. Ionic Mechanisms Underlying Spontaneous CA1 Neuronal Firing in Ca(2+)-Free Solution. Biophys J. 84: 2099-2111 (2003).

Bikson, M., **Lian, J.** and Durand, D.M., Suppression of epileptiform activity by high frequency sinusoidal fields, J. of Physiology 531(Pt 1):181-91 (2001).

Shuai, J.W., **Lian, J.** and Durand, D.M., Positive Lyapunov exponents from time series of strange nonchaotic system, Physical Review E 64:026220-4 (2001).

CONFERENCE PRESENTATIONS

Lian J., Cullip T., Deschesne K., Harris S., Varia M. and Chang S. Film to CT registration to accumulate dose from brachytherapy and external beam radiotherapy In: the 50th ASTRO Annual Meeting. Boston, MA, 2008.

Lian J., Eljabaly K., Potter L., Deschesne K., and Chang S. Dose difference of Nucletron HDR planning with three source localization methods In: the 50th AAPM Annual Meeting, Houston, TX, 2008

Lian J., Cullip T., Deschesne K. and Chang S. Dose accumulation from film-based brachytherapy planning and CT-based external beam radiotherapy planning In: the 50th AAPM Annual Meeting, Houston, TX, 2008

Potter L., **Lian J**.*, Morris D., Deschesne K., Ewend M., and Chang S. Feasibility study of treating multiple tumors simultaneously with a 4-bank mMLC stereotactic radiosurgery system In: the 50th AAPM Annual Meeting, Houston, TX, 2008 (* corresponding author)

Foskey M. S., Rosenman J. G., Zeman E., **Lian J**., Fried D. and Joshi S.. How Much Does Patient Repositioning Using On-Treatment-Table CT Imaging Improve Prostate Cancer Treatment Outcome? In: the 48th ASTRO Annual Meeting. Philadelphia, PA, 2006.

Lian J., Cullip T., Deschesne K. and Chang S. Clinical significance based IMRT QA approach. In: the 48th AAPM Annual Meeting, Orlando, 2006

Lian J., Chang S., Cullip T., Deschesne K., Schreiber E., Gardner W., Potter L, and Euliss W, Implementation of the Tungsten-Compensator based Intensity-Modulated Radiotherapy (IMRT). In: the 47th AAPM Annual Meeting, Seattle, 2005

Mitra R, Bagala T, Olch A, Das I., Cheng C.4, Chopra K.5, Hasson B, Jiang Z, Murphy S, **Lian J**., and Ahnesjo A. Dosimetric Comparison of Inhomogeniety Corrections in IMRT Treatment Planning Systems: A Collaborative Study. In: the 47th AAPM Annual Meeting, Seattle, 2005. (authors play equal role.)

Lian J. and Xing L. Biological Model Based IMRT Optimization with Inclusion of Parameter Uncertainty. In: the 14th International Conference on the Use of Computers in Radiation Therapy (ICCR), Seoul, Korea, 2004

Lian J., Hunjan S., Dumoulin C., Levin J., Watkins R., Rohling K., Giaquinto R., Kim D., Lo A., Spielman D., Daniel B., and Xing L. Integrating deformable MRI/MRSI and CT image registration into the prostate IMRT treatment planning. In: the 45th ASTRO Annual Meeting. Salt Lake City, UT, 2003.

Lian J., Spielman D., Cotrutz C., Hunjan S., Adalsteinsson E., King C., Luxton G., Kim D., Daniel B. and Xing L. Including metabolic uncertainty into proton MR spectroscopic imaging (MRSI)-guided inverse treatment planning. In: the 45th AAPM Annual Meeting, San Diego, 2003.

Lian J., Hunjan S., Daniel B., Lo A., Levin J., Cardenas C., Dumoulin C., Watkins R., Rohling K., Giaquinto R., Boyer A. and Xing L. Mapping of the prostate in endorectal coil-based MRI/MRSI and CT: a deformable registration and validation study. In: the 45th AAPM Annual Meeting, San Diego, 2003.

Hunjan S., **Lian J.**, Dumoulin C., Levin J., Watkins R., Rohling K., Giaquinto R., Kim D., Adelsteinsson A., Boyer A., Spielman D., Daniel B. and Xing L. Utility of 3 Tesla MRSI for guiding prostate IMRT In: the 45th ASTRO Annual Meeting, Salt Lake City, 2003.

Lian J., Cotrutz C. and Xing L. Inverse treatment planning with probabilistic dose prescription. In: the 44th ASTRO Annual Meeting, New Orleans, 2002.

Lian J., Cotrutz C. and Xing L. IMRT dose optimization with probabilistic dose prescription. In: the 44th AAPM Annual Meeting, Montreal, 2002.

Xing L., **Lian J.** and Cotrutz C. Inverse treatment planning with inclusion of model parameter uncertainty. In: the 44th AAPM Annual Meeting, Montreal, 2002.

Xing, L., Cotrutz, C., Pugachev, A., **Lian, J.**, Crooks, S., Hunjun, S., Yang, D. and Boyer, A. Recent progress in IMRT inverse treatment planning. In: the 44th AAPM Annual Meeting, Montreal, 2002.

Durand D.M., **Lian J.**, and Marom B. Suppression of epileptiform activity by high-frequency stimulation in vitro. In: Annual Meeting of the American Epilepsy Society, 2002.

Lian, J., Bikson, M., Shuai, J.W. and Durand, D.M. Propagation of epileptiform activity across the lesion, In: Annual Meeting of Society for Neuroscience, San Diego, 2001.

Lian, J., Bikson, M., Shuai, J.W. and Durand, D.M. Propagation of low calcium epileptiform activity in the rat hippocampus, Functional Electrical Stimulation annual meeting, Cleveland, 2000.

Lian, J., Shuai, J.W. and Durand, D.M. Nonlinear dynamic properties of low calcium induced epileptiform activity, World Congress on Medical Physics and Biomedical Engineering, Chicago, 2000.

Shuai, J.W., **Lian, J.** and Durand, D.M. Positive Lyapunov exponent from time series of strange nonchaotic system, World Congress on Medical Physics and Biomedical Engineering, Chicago, 2000.

Bikson, M., **Lian, J.** and Durand, D.M., Effect of high frequency stimulation on epileptiform activity in the hippocampus, Soc. Neurosci. Abstr., 25:1870 (1999).

RESEARCH INTERESTS

- Image processing in radiation therapy.
- 4D adaptive radiotherapy.
- Biological modeling based IMRT.
- IMRT optimization, segmentation and QA.
- In vivo dosimetry.