BIOGRAPHICAL SKETCH

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NAME:	Ma, Lijun
eRA COMMONS USER NAME (credential, e.g., agency login):	lijunm
POSITION TITLE:	Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of North Carolina at Chapel Hill	PhD	1995	Radiation Physics
Stanford University	Postdoctoral	1998	Radiation Physics

A. Personal Statement

I am the chief architect of the current proposal entitled “ODDS for Brain Radiosurgery”, which mirrors my roles and expertise as NRC authorized and state-licensed radiosurgical user.

On a national level, I have served as PI on research grants from US Army, NIH, Komen Breast Cancer Foundation and Stanford/UCSF intramural awards. I have over 200 publications, and my most recent awards include American Board of Radiology service award and Lawrence Margolis Life Teaching Award in 2019. Since 2005, I have been awarded multiple PCT/US patents on radiation medicine, three of which are shared with Professor Sean Luan, co-PI of this proposal on brain radiosurgery.

On an international level, I have served as a board member and chair of international radiosurgical societies and committees. I have also led publications of international treatment guidelines on brain radiosurgery, and have co-edited a Taylor&Francis textbook entitled “Hypofractionated Image-Guided Stereotactic Radiosurgery” in 2016. Since 2015, I continued to contribute to the authoritative “Younmans Neurological Surgery” textbook.

Regardless my passion is not about publishing papers nor writing, but on finding ways to eradicate brain tumors. This was a personal promise that I made to my high-school best friend who succumbed to brain tumor after a tough fight. I firmly believe that the invention of ODDS hold the answer to fulfilling such a promise. Our goal is to place ODDS at the hands of thousands of surgeons and radiation oncologists in the world, and I cannot imagine how many cancer patients, especially brain tumor patients, would benefit from such a tool.

B. Positions and Honors

Positions and Employment

1998 – present Current Position: Full Professor in Residence, UCSF Radiation Oncology

Other Experience and Professional Memberships

1990-present Member, AAAS and APS

2015-present Founding Board Member, Journal of Radiosurgery and SBRT (official journal of ISRS)

2013-present Founding Editorial Member, Technology in Cancer Research and Treatments.

2015-present Scientific Reviewer, CDMRP Panels; French NCI; Canadian CIHR

Honors

2014 International Atomic Energy Agency (IAEA) Invited Professor for Regional Practice of SBRT

2015 AAPM Fellow Service Award from American Board of Radiology

2019 Lawrence Margolis MD Lifetime Teaching Award, UCSF Radiation Oncology

C. Contributions to Science

C.1 Brain Radiosurgery: Brain radiosurgery is the passion and primary area of my research and clinical services. I have performed > 5000 brain radiosurgery procedures. I have led successful completion of clinical and research projects with >30 million dollars in initial capital investments. I have served as the physics and licensing lead of UCSF Gamma Knife radiosurgery program since January 1, 2006. Key publications related to the *Gamma Knife Radiosurgery* is listed as follows

1. **L. Ma,** P. Xia, L Verhey, and A Boyer "A dosimetric comparison of a fan-beam intensity modulated system with Gamma Knife stereotactic system for treating intermediate intracranial lesions" Int. J. of Rad. Oncol. Biol Phys. 45 (5): 1325-1330, 1999.
2. **L. Ma** "Dependence of normal brain integral dose and Normal Tissue Complication Probability on the peripheral Gamma Knife prescription isodose values", Phys Med. Biol. 46(11) 3031-3041, 2001.
3. **L. Ma**, Y. Kwok, L. Chin, J. Simard, and W.F. Regine, "Concomitant GRID Boost for Gamma Knife Radiosurgery", Med. Phys. 32(11), 3419-3423, 2005.
4. **L. Ma**, D. Larson, P. Petti, C. Chuang and L. Verhey, "Boosting Central Target Dose by Optimizing Embedded Dose Hot Spots For Gamma Knife Radiosurgery", Stereotactic and Functional Radiosurgery, Vol 85, No 4, 259-263 2007.
5. S Luan, N Swanson, and **L Ma**. Dynamic Gamma Knife Radiosurgery, *Physics in Medicine and Biology*, 54 (2009), 1579-1591.
6. **L. Ma**, L Verhey, M McDermott, K Huang, C Chuang, V Smith and P Sneed "Effect of Composite Sector Collimation on Average Dose Fall-off for Gamma Knife Perfexion". J. Neurosurgery, Vol 109, No. 6, 15-20, 2008.
7. **L Ma**, L Lee, I Barani, A Hwang, S Fogh, J Nakamura, M McDermott, P Sneed, D A Larson, and A Sahgal, "Shot Sequencing Based on Biological Equivalent Dose Considerations for Multiple Isocenter Gamma Knife Radiosurgery" Phys Med Biol, (56) 23: 7247-7256, 2011.
8. **L Ma**, Nichol, S Hossain, B Wang, P Petti, R Vellani, C Higby, S Ahmad, I Barani, D C Shrieive, D Larson and A Sahgal, "Variable dose interplay effects across radiosurgical apparatus in treating multiple brain Metastases" Vol 9 No. 3 Int J of Computer Assist Radiology and Surg DOI:10.1007/s11548-014-1001-4, 2014.
9. **L Ma,** A Sahgal, D Larson, D Pinnaduwage, S Fogh, I Barani, J Nakamura, M McDermott and P Sneed "Impact of Millimeter Level Margins on Peripheral Normal Brain Sparing for Intracranial Radiosurgery" Int J Radiat Oncol Biolo Phys, Vol 89(1)206-213. 2015.
10. **L Ma**, E Mason, P Sneed, M McDermott, A Polishchuk, D Larson and A Sahgal "Clinical realization of sector beam intensity modulation for Gamma Knife radiosurgery" Int J Radiat Oncol Phys Biol, 2015 Mar 1;91(3):661-8.
11. D Rifrio, S Luan, J Zhou, **L Ma**, "Particle swarm optimization for radiation therapy planning", ACM Proceeding on Bioinformatics, Computational Biology and Health Informatics, p250-257, 2015.
12. **L Ma,** S Braunstein, P V Theodosopoulos, M McDermott, P Sneed "Inherent Functional Dependence Among Cochlear Dose Surrogates for Stereotactic Radiosurgery of Vestibular Schwannomas" Pract Radiat Oncol, 2016.
13. S Braunstein and **L Ma**, "Stereotactic Radiosurgery of Vestibular Schwannomas" Cancer Management and Research, Vol 10, pg 3733-3740, 2018.
14. S Soltys, M Milano, J Xue, W Tome, E Yorke, J Sheehan, G X Ding, J Kirkpatrick**, L Ma**, S Sahgal, T Solberg, J Adler, J Grimm, I El Naqa, "Stereotactic Radiosurgery for Vestibular Schwannomas: Tumor Control Probability Analyses and Recommended Reporting Standards" Int J Radiat Oncol Biol Phys. 2021 in press.

C.2 Spinal Tumor SBRT: Image-guided stereotactic body radiotherapy (SBRT) was introduced to treat spine tumors in a similar fashion as brain tumors. UCSF team was one of the pioneers in the world for spine SBRT.

1. A Sahgal, D A Larson, E Massicotte, R Rampersaud, A Yee, M Fehlings, S Lewis, D Letourneau, B Millar, D Hyde and **L Ma,** "Stereotactic Body Radiotherapy for Spine Metastases" J. of Pain Management Vol 4 (1) 1914-39, 2010.
2. A Sahgal, **L Ma**, V Weinberg, I Gibbs, S Chao, U, Chang, M Werner-Wasik, L Angelov, E Chang, M Sohn, S Soltys, D Letoureau, S Ryu, P Gerstzten, J Fowler, S Wong, and D A Larson, "Re-irradiation Spinal Cord Tolerance for Stereotactic Body Radiotherapy", Int. J. of Rad. Oncol. Biol. Phys., Vol 82(1) 107-116, 2012.
3. **L Ma**, L Wang, C Tseng, A Sahgal, "Emerging Technologies in Stereotactic Body Radiotherapy". Chin Clin Oncol doi: 10.21037/cco.2017.06.19, 2017
4. S Soltys, J Grimm, M Milano, J Xue, A Sahgal, E Yorke, Y Yamada, G X Ding, X A. Li, M Lovelock, A Jackson, **L Ma**, I El Naqa, I Gibbs, L Marks and S Benedict "Stereotactic Body Radiation Therapy for Spinal Metastases: Tumor Control Probability Analyses and Recommended Reporting Standards" Int J Radiat Oncol Biol Phys. 2021, in press.

C.3 Prostate Cancer Radiotherapy: Intensity modulated arc therapy (IMAT) or volumetric modulated arc therapy (VMAT) was pioneered at the University of Maryland, I was the lead author that developed and published the first-time use of IMAT/VMAT for prostate cancer radiotherapy.

1. **L. Ma,** C. Yu, M. Earl, T. Holmes, M. Sarfaraz, A. Li, D. Shepard, P. Amin, S. DiBiase, M. Suntharalingam and C. Mansfield "Optimized intensity modulated arc therapy for prostate cancer treatments", Int. J. Cancer /Rad. Oncol. Invest. Vol. 96 (6) 379-384, 2001.
2. S. Hossain, P. Xia, C Chuang, A Gottschalk, G Mu, L Verhey and **L. Ma**, "Simulated Real Time Image Guided Intra-Fraction Tracking Delivery for Hypofractionated Prostate IMRT", Med. Phys. 35(9)4041-4048, 2008. Won the best technical paper award for annual radiosurgical society conference.
3. S. Hossain, P Xia, K Huang, M Descovich, C Chuang, A R Gottschalk, M Roach, and **L Ma**, "Dose Gradient near Target and Normal Structure Interface for Non-isocentric CyberKnife and Isocentric Intensity-modulated Body Radiotherapy of Prostate Cancer", Int. J. of Rad. Oncol. Biol. Phys., 78(1) 58-63, 2010.
4. S Shiao, A Sahgal, W Hu, S J, C Chuang, M Descovich, I-Chow Hsu, A Gottschalk, M Roach and **L Ma,** "Temporal compartmental dosing effects for robotic prostate stereotactic body radiotherapy" Phys Med Biol, (56)24:7767-7775, 2011.
5. J Knisely, A Sahgal, S Lo**, L Ma**, E Chang"SRS/SBRT---Reflection on the Last Decade Achievements and Future Directions" Ann Palliat Med 52(6) 139-144, 2016.

C.4 Breast Cancer Radiotherapy: Developing breast conservation therapy (BCT) was championed by Dr. Carl Mansfield at the University of Maryland. I invented a new technique called "Helical Electron Avoidance Radiation Therapy"(HEART) aiming toward heart-sparing via magnetically collimated electron beams for BCT.

1. M. Earl and **L. Ma,** "Depth dose enhancement of electron beams subject to uniform longitudinal magnetic fields: a Monte Carlo study" Med. Phys., 29(4) 484-491, 2002.
2. N. Phaisangittisakul, W. D. D'Souza, and **L. Ma**, "Magnetic collimation and metal foil filtration for electron range and fluence modulation", Med. Phys. 31(1)17-23, 2004.
3. **L. Ma,** "Dosimetric properties of magnetically collimated electron beam for radiation therapy", Med. Phys. 31(11), 2973-2977, 2004.
4. **L Ma**, Hwang A. Improving regional dose distribution while maintaining high delivery ef ciency for hypofractionated whole breast radiotherapy. Therap Radiol Oncol 2:60, 2018.

C.5 Intensity Modulated Radiotherapy (IMRT): Dr Art Boyer at Stanford pioneered IMRT in the early 1990s. IMRT QA was a hot research topic when I was at Stanford.

1. **L. Ma,** P.B. Geis and A.L. Boyer, "Quality assurance for dynamic multileaf modulated fields using a fast beam imaging system" Med Phys. 24:1213-1220, 1997.
2. **L. Ma,** A.L. Boyer, D.O. Findley, P.B. Geis, and E. Mok, "Application of a vido-optic beam imaging system for quality assurance of medical accelerators", Phys. Med. Biol. 43: 3649-3659, 1998.
3. **L. Ma**, A.L. Boyer, C. Ma, and L. Xing, "Synchronizing dynamic multileaf collimators for producing two-dimensional intensity modulated fields with minimum beam delivery time", Int. J. of Rad. Oncol. Biol. Phys. 44 (5): 1147-1154, 1999.
4. **L. Ma,** C.X. Yu, and M. Sarfaraz, "A new method of dosimetrically shaping static radiation fields using multileaf collimators" Med. Phys. 27(5) 972-977, 2000.
5. E Klein, J Hanley, J Bayouth, F-F Yin, S Dresser, C Serago, F Aguirre, **L. Ma,** B Arjomandy, C Liu, AAPM TG142 Report "Quality Assurance of Medical Accelerators", Med. Phys., 36(9):4197-4212. 2009.
6. J Hanley, F Aguirre, B Arjomandy, J Bayouth, S Dresser, E Klein, D Letourneau, C Liu, **L Ma**, W Simon, C Serago F-F Yin, R Flynn "A implementation guide for TG142 quality assurance of medical accelerators", Med Phys, approved by the AAPM science council and in press, 2020.

A Partial List of My Publications: https://scholar.google.com/citations?user=UgnxqiwAAAAJ&hl=en&oi=ao

D. Additional Information: Research Support and/or Scholastic Performance

Number of DoD/NIH/NSF/Komen Foundation/Intramural Awards:	10 (since 2000)
US and International patents:	4 (3 with co-PI Dr Sean Luan)