CHUNFENG LIAN

OFFICE: 130 Mason Farm Road, Chapel Hill, NC 27599, United States

EMAIL: chunfeng_lian@med.unc.edu **HOMEPAGE:** http://cflian.web.unc.edu/

RESEARCH INTEREST

- **Medical Image Computing**
  - *Computer-Aided Diagnosis/Prediction* (e.g., brain disease diagnosis with neuroimaging data; cancer therapy outcome prediction with radiomics data)
  - *Volumetric Image Analysis* (e.g., segmentation; detection; synthesis)
  - *3D Mesh/Point Cloud Analysis* (e.g., surface labeling/segmentation; surface-to-surface synthesis)
- **Pattern Recognition & Machine Learning**
  - *Deep Learning; Feature Selection; Metric Learning; Semi-Supervised Learning; Multi-Task Learning*

EDUCATION

Université de Technologie de Compiègne, CNRS (Heudiasyc Lab), France Oct. 2013 - Jan. 2017
Ph.D. in Computer Engineering *Profs. Thierry Denœux & Su Ruan*

Project: "Information Fusion and Decision-Making Using Belief Functions: Application to Therapeutic Monitoring of Cancer"

Xidian University, China Sep. 2010 - Sep. 2013
Postgraduate-Doctoral Program in Pattern Recognition and Intelligent Systems *Prof. Jimin Liang*

Xidian University, China Sep. 2006 - Jul. 2010
B.S. in Electronic and Information Engineering

RESEARCH EXPERIENCE

Department of Radiology, University of North Carolina at Chapel Hill Mar. 2017 - present
Postdoctoral Research Associate *Prof. Dinggang Shen*

PUBLICATIONS

♯ Co-first authors; ∗ Corresponding author.

JOURNAL

34. **[TPAMI'19]** Chunfeng Lian, Mingxia Liu, Jun Zhang, and Dinggang Shen. "Hierarchical Fully Convolutional Network for Joint Discriminative Atrophy Localization and Alzheimer's Disease Diagnosis using Structural MRI." *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2019. [link]
33. **[TIP'19]** Chunfeng Lian, Su Ruan, Thierry Denœux, Hua Li, and Pierre Vera. "Joint Tumor Segmentation in PET-CT Images using Co-Clustering and Fusion based on Belief Functions." *IEEE Transactions on Image Processing*, 2019. [link]
32. **[PNAS'19]** Fan Wang, Chunfeng Lian, Zhengwang Wu, Han Zhang, Tengfei Li, Yu Meng, Li Wang, Weili Lin, Dinggang Shen, and Gang Li. "Developmental Topography of Cortical Thickness during Infancy." *Proceedings of the National Academy of Sciences*, 2019. [link]

31. **[MedIA'18]** Chunfeng Lian, Jun Zhang, Mingxia Liu, Xiaopeng Zong, Sheng-Che Hung, Weili Lin, Dinggang Shen. "Multi-Channel Multi-Scale Fully Convolutional Network for 3D Perivascular Spaces Segmentation in 7T MR Images." *Medical Image Analysis*, 2018. [link]

30. **[TBME'18]** Chunfeng Lian, Su Ruan, Thierry Denœux, Hua Li, and Pierre Vera. "Spatial Evidential Clustering with Adaptive Distance Metric for Tumor Segmentation in FDG-PET Images." *IEEE Transactions on Biomedical Engineering*, 2018. [link]

29. **[MedIA'16]** Chunfeng Lian, Su Ruan, Thierry Denœux, Fabrice Jardin, and Pierre Vera. "Selecting Radiomic Features from FDG-PET Images for Cancer Treatment Outcome Prediction." *Medical Image Analysis*, 2016. [link]

28. **[TFS'16]** Chunfeng Lian, Su Ruan, and Thierry Denœux. "Dissimilarity Metric Learning in the Belief Function Framework." *IEEE Transactions on Fuzzy Systems*, 2016. [link]

27. **[PR'15]** Chunfeng Lian, Su Ruan, and Thierry Denœux. "An Evidential Classifier based on Feature Selection and Two-Step Classification Strategy." *Pattern Recognition*, 2015. [link]

26. **[TRPMS'19]** Jian Wu♯, Chunfeng Lian♯, Su Ruan, Thomas Mazur, Sasa Mutic, Mark Anastasio, Perry Grigsby, Pierre Vera, Hua Li. "Treatment Outcome Prediction for Cancer Patients Based on Radiomics and Belief Function Theory." *IEEE Transactions on Radiation and Plasma Medical Sciences*, 2019. [link] (♯ Co-first authors)

25. **[TMI'19]** Xu Chen, Chunfeng Lian, Li Wang, Hannah Deng, Steve H Fung, Dong Nie, Kim-Han Thung, Pew-Thian Yap, Jaime Gateno, James J Xia, Dinggang Shen. "One-Shot Generative Adversarial Learning for MRI Segmentation of Craniomaxillofacial Bony Structures." *IEEE Transactions on Medical Imaging*, 2019. [link]

24. **[MedIA'19]** Tianjiao Liu, Qianqian Guo, Chunfeng Lian, Xuhua Ren, Shujun Liang, Jing Yu, Lijuan Niu, Weidong Sun, Dinggang Shen. "Automated Detection and Classification of Thyroid Nodules in Ultrasound Images using Clinical-Knowledge-Guided Convolutional Neural Networks." *Medical Image Analysis*, 2019. [link]

23. **[NIMG'19]** Liang Sun, Daoqiang Zhang, Chunfeng Lian, Li Wang, Zhengwang Wu, Wei Shao, Weili Lin, Dinggang Shen, Gang Li, UNC/UMN Baby Connectome Project Consortium. "Topological correction of infant white matter surfaces using anatomically constrained convolutional neural network." *NeuroImage*, 2019. [link]

22. **[TCYB'19]** Mingxia Liu, Jun Zhang, Chunfeng Lian, Dinggang Shen. "Topological correction of infant white matter surfaces using anatomically constrained convolutional neural network." *IEEE Transactions on Cybernetics*, 2019. [link]

21. **[MMSJ'19]** Fan Wang, Chunfeng Lian*, Pierre Vera, and Su Ruan. "Weakly-supervised Deep Learning for Brain Disease Prognosis using MRI and Incomplete Clinical Scores." *Multimedia Systems*, 2019. [link] (* Corresponding author)

20. **[NEUCOM'19]** Fan Wang, Samia Ainouz, Chunfeng Lian, and Abdelaziz Bensrhair. "Multimodality Semantic Segmentation based on Polarization and Color images." *Neurocomputing*, 2017. [link]

19. **[MedIA'18]** Jian Wu, Thomas R Mazur, Su Ruan, Chunfeng Lian, Nalini Daniel, Hilary Lashmett, Laura Ochoa, Imran Zoberi, Mark A Anastasio, H Michael Gach, Sasa Mutic, Maria Thomas, Hua Li. "A Deep Boltzmann Machine-Driven Level Set Method for Heart Motion Tracking Using Cine MRI Images." *Medical Image Analysis*, 2018. [link]

CONFERENCE

18. **[MICCAI'19]** Chunfeng Lian, Mingxia Liu, Li Wang, Dinggang Shen. "End-to-End Dementia Status Prediction from Brain MRI using Multi-Task Weakly-Supervised Attention Network." *22nd International Conference on Medical Image Computing and Computer-Assisted Intervention*, 2019. [link]

17. **[MICCAI'19]** Chunfeng Lian, Li Wang, Tai-Hsien Wu, Mingxia Liu, Francisca Duran, Ching-Chang Ko, Dinggang Shen. "MeshSNet: Deep Multi-Scale Mesh Feature Learning for End-to-End Tooth Labeling on 3D Dental

Surfaces." *22nd International Conference on Medical Image Computing and Computer-Assisted Intervention*, 2019. [link]

16. **[MICCAI'16]** Chunfeng Lian, Su Ruan, Thierry Denœux, Hua Li, and Pierre Vera. "Robust Cancer Treatment Outcome Prediction Dealing with Small-Sized and Imbalanced Data from FDG-PET Images." *19th International Conference on Medical Image Computing and Computer-Assisted Intervention*, 2016. [link]
15. **[MICCAI'15]** Chunfeng Lian, Su Ruan, Thierry Denœux, Hua Li, and Pierre Vera. "Dempster-Shafer Theory based Feature Selection with Sparse Constraint for Outcome Prediction in Cancer Therapy." *18th International Conference on Medical Image Computing and Computer-Assisted Intervention*, 2015. [link]
14. **[MICCAI'19]** Fan Wang, Chunfeng Lian, Zhengwang Wu, Li Wang, John Gilmore, Weili Lin, Dinggang Shen, Gang Li. "Revealing Developmental Regionalization of Infant Cerebral Cortex Based on Multiple Cortical Properties." *22nd International Conference on Medical Image Computing and Computer-Assisted Intervention*, 2019. [link]
13. **[MICCAI'19]** Yongsheng Pan, Mingxia Liu, Chunfeng Lian, Yongxia, Dinggang Shen. "Disease-Image Specific Generative Adversarial Network for Brain Disease Diagnosis with Incomplete Multi-Modal Neuroimages." *22nd International Conference on Medical Image Computing and Computer-Assisted Intervention*, 2019. [link]
12. **[MICCAI'18]** Yongsheng Pan, Mingxia Liu, Chunfeng Lian, Tao Zhou, Yong Xia, Dinggang Shen. "Synthesizing Missing PET from MRI with Cycle-consistent Generative Adversarial Networks for Alzheimer's Disease Diagnosis." *21st International Conference on Medical Image Computing and Computer-Assisted Intervention*, 2018. [link]
11. **[MICCAI'18]** Li Wang, Gang Li, Feng Shi, Xiaohuan Cao, Chunfeng Lian, Dong Nie, Mingxia Liu, Han Zhang, Guannan Li, Weili Lin, Dinggang Shen. "Volume-based Analysis of 6-month-old Infant Brain MRI for Autism Biomarker Identification and Early Diagnosis." *21st International Conference on Medical Image Computing and Computer-Assisted Intervention*, 2018. [link]
10. **[IEEE-ISBI'18]** Chunfeng Lian, Hua Li, Pierre Vera, and Su Ruan. "Unsupervised Co-Segmentation of Tumor in PET-CT Images Using Belief Functions Based Fusion." *IEEE 15th International Symposium on Biomedical Imaging*, 2018. [link]
9. **[IEEE-ISBI'17]** Chunfeng Lian, Su Ruan, Thierry Denœux, Hua Li, and Pierre Vera. "Tumor Delineation in FDG-PET Images Using A New Evidential Clustering Algorithm with Spatial Regularization And Adaptive Distance Metric." *IEEE 14th International Symposium on Biomedical Imaging*, 2017. [link]
8. **[IEEE-ISBI'15]** Chunfeng Lian, Su Ruan, Thierry Denœux, and Pierre Vera. "Outcome Prediction in Tumour Therapy based on Dempster-Shafer Theory." *IEEE 12th International Symposium on Biomedical Imaging*, 2015. [link]
7. **[IEEE-ICIP'17]** Chunfeng Lian, Su Ruan, Thierry Denœux, Yu Guo, and Pierre Vera. "Accurate Tumor Segmentation in FDG-PET Images with Guidance of Complementary CT Images." *IEEE International Conference on Image Processing*, 2017. [link]
6. **[IEEE-ISBI'18]** Fan Wang, Chunfeng Lian, Jing Xia, Zhengwang Wu, Dingna Duan, Li Wang, Dinggang Shen, and Gang Li. "Construction of Spatiotemporal Infant Cortical Surface Atlas of Rhesus Macaque." *IEEE 15th International Symposium on Biomedical Imaging*, 2018. [link]
5. **[IEEE-ISBI'18]** Jian Wu, Su Ruan, Chunfeng Lian, Sasa Mutic, Mark Anastasio, and Hua Li. "Active Learning with Noise Modeling for Medical Image Annotation." *IEEE 15th International Symposium on Biomedical Imaging*, 2018. [link]
4. **[IEEE-ISBI'18]** Jian Wu, Su Ruan, Thomas Mazur, Nalini Daniel, Hilary Lashmett, Laura Ochoa, Imran Zoberi, Chunfeng Lian, H. Michael Gach, Sasa Mutic, Maria Thomas, Mark Anastasio, and Hua Li. "Heart Motion Tracking on Cine MRI Based on a Deep Boltzmann Machine-Driven Level Set Method." *IEEE 15th International Symposium on Biomedical Imaging*, 2018. [link]

BOOK & BOOK CHAPTER

3. Heung-Il Suk, Mingxia Liu, Pingkun Yan, and Chunfeng Lian. "Machine Learning in Medical Imaging", Proceedings of MLMI2019, Springer, 2019. [link]
2. Ching-Chang Ko, Dinggang Shen, and Chunfeng Lian. "Machine Learning in Dentistry", Springer, (To Appear).
1. Mingxia Liu, Chunfeng Lian, and Dinggang Shen. "Anatomical Landmark based Deep Multi-instance Learning for Alzheimer's Disease Diagnosis." *Deep Learning in Healthcare*, Springer, (To Appear).

HONORS AND AWARDS

Finalist of John R. Cameron Young Investigator Competition, AAPM Annual Meeting and Exhibition	2015
Winner of Jack Krohmer Junior Investigator Competition, AAPM Annual Meeting and Exhibition	2018
Best Reviewer Award, MICCAI	2019

ACADEMIC SERVICES

- **Co-Chair**, The 10th International Workshop on Machine Learning in Medical Imaging (MLMI), 2019. [link]
- **PC Member**, The 9th International Workshop on Machine Learning in Medical Imaging (MLMI), 2018.
- **PC Member**, The 25th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), 2019.
- **PC Member**, The AAAI Conference on Artificial Intelligence (AAAI), 2018.
- **Journal & Conference Reviewer**
  - IEEE Transactions on Pattern Analysis and Machine Intelligence (IEEE-TPAMI)
  - Medical Image Analysis (MedIA)
  - Medical Image Computing and Computer-Assisted Intervention (MICCAI)
  - IEEE Transactions on Cybernetics (IEEE-TCYB)
  - IEEE Transactions on Biomedical Engineering (IEEE-TBME)
  - IEEE Journal of Biomedical and Health Informatics (IEEE-JBHI)
  - Pattern Recognition
  - Computerized Medical Imaging and Graphics
  - Artificial Intelligence in Medicine
  - Medical Physics
  - Knowledge-based Systems

INVITED TALKS

5. "Deep Learning for End-to-End Dementia Diagnosis with Structural MRI", *Wuhan University*, China, 2019.
4. "Cancer Therapy Outcome Prediction based on Dempster-Shafer Theory and PET Imaging", *Statistical Science Seminar, University College London*, United Kindom, 2016.
3. "Cancer Therapy Outcome Prediction based on Dempster-Shafer Theory and PET Imaging", *GdR ISIS Seminar – Méthodes d'apprentissage statistiques et applications à la santé, Télécom ParisTech*, France, 2016.
2. "Information Fusion and Decision-Making Using Belief Functions: Application to Therapeutic Monitoring of Cancer", *Northwestern Polytechnical University*, China, 2016.
1. "Outcome Prediction in Cancer Therapy based on Dempster-Shafer Theory and PET Imaging", *GdR ISIS Seminar – Traitement, Analyse, Indexation en Imagerie du Vivant, Université Paris-Descartes*, France, 2015.

MENTORING & ACTIVITIES

- Undergraduate Student & Postdoc Research Mentor (2018 - Present): Xu Chen (ongoing), Yankun Lang (ongoing), Xiaoyang Chen (ongoing), Deqiang Xiao (ongoing), Lei Ma (ongoing), Xuanang Xu (ongoing)

REFERENCES

Prof. **Dinggang Shen** (postdoc advisor)
Department of Radiology
University of North Carolina at Chapel Hill
Web: http://shen.web.unc.edu/
Email: dinggang_shen@med.unc.edu

Prof. **Thierry Denœux** (PhD advisor)
Heudiasyc Lab (CNRS UMR 7253)
Université de Technologie de Compiègne, France
Web: https://www.hds.utc.fr/~tdenoeux/
Email: tdenoeux@utc.fr

Prof. **Su Ruan** (PhD advisor)
LITIS Lab (EA 4108)
University of Rouen Normandy, France
Web: http://pagesperso.litislab.fr/suruan/
Email: su.ruan@univ-rouen.fr

Prof. **Ching-Chang Ko**
Department of Orthodontics
University of North Carolina at Chapel Hill
Web: https://www.dentistry.unc.edu
Email: Ching-Chang_Ko@unc.edu

Assoc. Prof. **Hua Li**
Department of Bioengineering
University of Illinois at Urbana-Champaign
Web: https://huali.bioengineering.illinois.edu/
Email: huali19@illinois.edu