

# QING DAI

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------|------------------------|
| Education                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Ph.D. Candidate in Bioengineering                                                                                                                                                                                                                                                                                                      |                                                                 | 2020 – Present              |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | University of California, Los Angeles                                                                                                                                                                                                                                                                                                  |                                                                 |                             |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Advisor: Dr. Holden H. Wu                                                                                                                                                                                                                                                                                                              |                                                                 |                             |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Thesis: Advanced MRI and MR Thermometry Techniques for Guiding Thermal Therapies                                                                                                                                                                                                                                                       |                                                                 |                             |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | M.S. in Biomedical Imaging                                                                                                                                                                                                                                                                                                             |                                                                 | 2018 – 2019                 |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | University of California, San Francisco                                                                                                                                                                                                                                                                                                |                                                                 |                             |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Advisor: Dr. Peder E. Z. Larson                                                                                                                                                                                                                                                                                                        |                                                                 |                             |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Thesis: Deep Learning Prediction of Renal Tumor Grade from Contrast-Enhanced CT                                                                                                                                                                                                                                                        |                                                                 |                             |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | B.S. in Biochemistry, Minor in Bioinformatics                                                                                                                                                                                                                                                                                          |                                                                 | 2013 – 2017                 |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | University of California, Los Angeles                                                                                                                                                                                                                                                                                                  |                                                                 |                             |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                             |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Professional Experience                                                                                                                                                                                                                                                                                                                | University of California, Los Angeles                           |                             | 2020 – Present         |
| Graduate Student Researcher                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                             |                        |
| <ul style="list-style-type: none"><li>• Developing real-time MRI and MR thermometry techniques for MRI-guided minimally invasive abdominal interventions.</li><li>• Developing MR-guided nanoparticle drug delivery platforms and cancer theranostics.</li><li>• Leading experimental design, execution, and advanced data analysis across benchtop phantom, pre-clinical animal models (mouse and pig), and human subjects.</li><li>• Collaborating with a multi-disciplinary team of radiologists, physicians, engineers, chemists, veterinarians, and industrial collaborators toward clinical translation.</li></ul> |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                             |                        |
| University of California, Los Angeles                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                        | 2025                                                            |                             |                        |
| Technology Fellow, UCLA Technology Development Group                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                             |                        |
| <ul style="list-style-type: none"><li>• Drafting technology non-confidential disclosures and identifying marketing targets to facilitate university technology licensing and commercialization.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                             |                        |
| University of California, San Francisco                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                        | 2018 – 2020                                                     |                             |                        |
| Research Specialist                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                             |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <ul style="list-style-type: none"><li>• Developed quantitative models for renal tumor cells detection, classification, and aggressiveness prediction from contrast-enhanced CT and clinical metadata.</li><li>• Built kinetic models and metabolic quantification methods for dynamic hyperpolarized carbon-13 pyruvate MRI.</li></ul> |                                                                 |                             |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | University of California, Los Angeles                                                                                                                                                                                                                                                                                                  |                                                                 | 2016 – 2018                 |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Research Assistant                                                                                                                                                                                                                                                                                                                     |                                                                 |                             |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <ul style="list-style-type: none"><li>• Developed a high-throughput image processing and cell counting pipeline for immunohistochemistry using machine learning techniques.</li></ul>                                                                                                                                                  |                                                                 |                             |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Research Interests                                                                                                                                                                                                                                                                                                                     | Thermal Ablation                                                | Image Guidance & Navigation | Computational Modeling |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                        | Image Reconstruction                                            | Machine Learning/AI         | Nano Theranostics      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Academic Societies                                                                                                                                                                                                                                                                                                                     | International Society in Magnetic Resonance in Medicine (ISMRM) |                             |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                        | Institute of Electrical and Electronics Engineers(IEEE)         |                             |                        |
| Focused Ultrasound Foundation (FUS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                             |                        |
| International Society for Therapeutic Ultrasound (ISTU)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                             |                        |

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| <b>Honors</b>               | <i>Bioengineering Graduate Fellowship</i> , UCLA Graduate Division                                                                                                                                                                                                                                                                                                                                                                                                           | 2020, 2026  |
|                             | <i>Magna Cum Laude Merit Award</i> , ISMRM                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2026        |
|                             | <i>Trainee Travel Award</i> , Jonsson Comprehensive Cancer Center                                                                                                                                                                                                                                                                                                                                                                                                            | 2025        |
|                             | <i>AMPC Selected Award</i> , ISMRM                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2024–2025   |
|                             | <i>Summa Cum Laude Merit Award</i> , ISMRM                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2023–2025   |
|                             | <i>Educational Stipend</i> , ISMRM                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2023–2025   |
|                             | <i>Interventional MR Study Group Award (2nd Place)</i> , ISMRM                                                                                                                                                                                                                                                                                                                                                                                                               | 2023        |
|                             | <i>Outstanding Poster Award</i> , Hyperpolarized Carbon-13 MRI Workshop                                                                                                                                                                                                                                                                                                                                                                                                      | 2020        |
| <b>Professional Service</b> | <i>Reviewer</i> , International Journal of Hyperthermia                                                                                                                                                                                                                                                                                                                                                                                                                      | 2026        |
|                             | <i>Reviewer</i> , Magnetic Resonance in Medicine                                                                                                                                                                                                                                                                                                                                                                                                                             | 2026        |
|                             | <i>Code Reviewer</i> , Magnetic Resonance in Medicine                                                                                                                                                                                                                                                                                                                                                                                                                        | 2024 - 2026 |
|                             | <i>Abstracts Reviewer</i> , ISMRM Annual Meetings                                                                                                                                                                                                                                                                                                                                                                                                                            | 2023 - 2026 |
|                             | <i>Organizer</i> , MRRL Journal Club                                                                                                                                                                                                                                                                                                                                                                                                                                         | 2022 - 2026 |
| <b>Journal Publications</b> | 1. <b>Dai Q</b> , Chiang J, Shih SF, Zhou W, Lu DSK, Wu HH. Active electromagnetic interference suppression for MR thermometry during MR-guided microwave ablation. <i>Magnetic Resonance in Medicine</i> . 2026. doi: 10.1002/mrm.70440                                                                                                                                                                                                                                     |             |
|                             | 2. Sahin S, Diaz E, Rajagopal A, Abtahi M, Jones S, <b>Dai Q</b> , Kramer S, Wang Z, Larson PEZ. UCSF RMaC: A University of California San Francisco 3D Multi-Phase Renal Mass CT Dataset with Tumor Segmentations. Preprint available at <i>medRxiv</i> . doi:10.1101/2026.02.11.26346096.                                                                                                                                                                                  |             |
|                             | 3. Zhou W, <b>Dai Q</b> , Curiel O, Tsao TC, Chiang J, Lu DS, Wu HH. Keypoint detection network for needle localization on intra-procedural MRI in MRI-guided liver interventions. <i>International Journal of Computer Assisted Radiology and Surgery</i> . 2026. doi:10.1007/s11548-026-03592-5.                                                                                                                                                                           |             |
|                             | 4. <b>Dai Q</b> , Shih SF, Curiel O, Tsao TC, Lu DS, Chiang J, Wu HH. Volumetric thermometry in moving tissues using stack-of-radial MRI and an image-navigated multi-baseline proton resonance frequency shift method. <i>Magnetic Resonance in Medicine</i> . 2026;95(2):803-819. doi:10.1002/mrm.70074.                                                                                                                                                                   |             |
|                             | 5. Deng T <sup>†</sup> , <b>Dai Q</b> <sup>†</sup> , Estabrook DA, Chapman J, Sletten EM, Wu HH, Zink JI. Thermoresponsive polymer-modified SiO <sub>2</sub> / gadolinium-diethylenetriamine pentaacetic acid composite nanoparticles for magnetic resonance imaging-guided ultrasound-modulated contrast enhancement at human body temperatures. <i>ACS Applied Nano Materials</i> . 2025;8(47):22835-22844. doi:10.1021/acsanm.5c04320 ( <sup>†</sup> equal contribution). |             |
|                             | 6. Sahin S, Haller AB, Gordon J, Kim Y, Hu J, Nickles T, <b>Dai Q</b> , Leynes AP, Vigneron DB, Wang ZJ, Larson PEZ. Spatially constrained hyperpolarized <sup>13</sup> C MRI pharmacokinetic rate constant map estimation using a digital brain phantom and a U-Net. <i>Journal of Magnetic Resonance</i> . 2025;371:107832. doi:10.1016/j.jmr.2025.107832.                                                                                                                 |             |
|                             | 7. Zhong X, Nickel MD, Kannengiesser SAR, Dale BM, Han F, Gao C, Shih SF, <b>Dai Q</b> , Curiel O, Tsao TC, Wu HH, Deshpande V. Accelerated free-breathing liver fat and R <sub>2</sub> <sup>*</sup> quantification using multi-echo stack-of-radial MRI with motion-resolved multidimensional regularized reconstruction: Initial retrospective evaluation. <i>Magnetic Resonance in Medicine</i> . 2024;92(3):1149-1161. doi:10.1002/mrm.30117.1.                          |             |
| <b>Conference Papers</b>    | 8. Li J, Hou Q, Pang K, Miao Q, Hung ALY, Aygun E, Shih SF, <b>Dai Q</b> , Wu HH, Sung KH. CoDe: A Self-Supervised Consistency Model Framework for MRI Denoising. <i>2026 IEEE 23rd International Symposium on Biomedical Imaging (ISBI)</i> , 2026. doi: 10.1109/ISBI61048.2026.11515485.                                                                                                                                                                                   |             |
|                             | 9. Pham B, Gaonkar B, Whitehead W, Moran S, <b>Dai Q</b> , Macyszyn L, Edgerton VR. Cell counting and segmentation of immunohistochemical images in the spinal cord:                                                                                                                                                                                                                                                                                                         |             |

Comparing deep learning and traditional approaches. *2018 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2018. pp. 842-845. doi: 10.1109/EMBC.2018.8512442.

## Conference Abstracts

1. **Dai Q**, Chiang J, Zhou W, Lu D, Wu HH. Characterizing the spatiotemporal thermal effects of pulsed microwave ablation with computational modeling and MR thermometry. *International Society for Magnetic Resonance in Medicine Annual Meeting, 2026, Cape Town, South Africa. (Magna Cum Laude)*
2. Zhou W, **Dai Q**, Kerr CR, Shih SF, Delgado T, Tsao TC, Lu DS, Chiang J, Wu HH. End-to-end framework for real-time image reconstruction, device and tissue tracking in MRI-guided liver interventions. *International Society for Magnetic Resonance in Medicine Annual Meeting, 2026, Cape Town, South Africa. (Magna Cum Laude)*
3. **Dai Q**, Shih SF, Chiang J, Lu DS, Wu HH. Active electromagnetic interference suppression for real-time MR thermometry during MR-guided microwave ablation. *International Society for Magnetic Resonance in Medicine Annual Meeting, 2025, Honolulu, HI, USA. p0677. (Summa Cum Laude & AMPC Selected)*
4. **Dai Q**, Chiang J, Nyborg G, Shih SF, Lu DS, Wu HH. Real-time MR thermometry to monitor microwave ablation and predict the ablation zone: Validation in an oncopig cancer model using immediate post-ablation MRI and gross pathology. *International Society for Magnetic Resonance in Medicine Annual Meeting, 2025, Honolulu, HI, USA. p2189.*
5. Zhou W, **Dai Q**, Curiel O, Lu DS, Chiang J, Tsao TC, Wu HH. 3D keypoint-based neural network for rapid needle localization on multislice 2D MRI. *International Society for Magnetic Resonance in Medicine Annual Meeting, 2025, Honolulu, HI, USA. p2040.*
6. **Dai Q**, Nyborg G, Shih SF, Pham J, Lu DS, Chiang J, Wu HH. MR-guided hepatic microwave ablation with real-time MRI guidance and MR thermometry: Initial experience in an oncopig cancer model. *14th Interventional MRI Symposium, 2024, Annapolis, MD, USA.*
7. **Dai Q**, Shih SF, Curiel O, Chiang J, Lu DS, Tsao TC, Wu HH. Dynamic 3D thermometry in moving tissue using accelerated stack-of-radial MRI and an image-navigated multi-baseline PRF method. *International Society for Magnetic Resonance in Medicine Annual Meeting, 2024, Singapore. p1277. (Summa Cum Laude & AMPC Selected)*
8. **Dai Q**, Shih SF, Zhou J, Zhang L, Wu HH. Dynamic 3D stack-of-radial multi-baseline PRF MR thermometry using compressed sensing reconstruction and image-based navigation. *International Society for Magnetic Resonance in Medicine Annual Meeting, 2023, Toronto, ON, Canada. p4987. (Summa Cum Laude)*
9. **Dai Q**, Zhang L, Li X, Yu P, Tsao TC, Wu HH. Dynamic 3D stack-of-radial PRF MR thermometry to monitor high-intensity focused ultrasound heating: Validation in a tissue motion phantom. *International Society for Magnetic Resonance in Medicine Annual Meeting, 2022, London, UK. p4084.*
10. **Dai Q**, Tang S, Meng MV, Slater JB, Gordon JW, Vigneron DB, Larson PEZ, Wang ZJ. Initial experience of hyperpolarized  $^{13}\text{C}$  pyruvate MRI in patients with renal tumors. *Hyperpolarized Carbon-13 MRI Technology Development Workshop, 2020, San Francisco, CA, USA.*
11. **Dai Q**, Kramer SP, Leynes AP, Magudia K, Wang ZJ, Larson PEZ. Deep learning-based prediction of renal cancer grading from contrast-enhanced CT. *UCSF Annual Imaging Research Symposium, 2019, San Francisco, CA, USA.*

## Patents

1. Wu HH, **Dai Q**. Active Electromagnetic Interference Suppression for Magnetic Resonance Imaging-Guided Intervention. U.S. Provisional Patent Application, filed March 2026. (Patent Pending)
2. Wu HH, Zhou W, **Dai Q**, Lu DS. Keypoint Detection Network for Device Localization on Intra-procedural MRI. U.S. Provisional Patent Application, filed March 2026. (Patent Pending)

## Featured Talks & Presentations

**Accelerate Medical Imaging Research with AI Tools: From Ideas to Publication.** Joint Journal Club (MRRL  $\times$  CVIB), Department of Radiological Science, University of California, Los Angeles, CA, 2026.

**Volumetric Thermometry in Moving Tissues using Stack-of-Radial MRI.** International Youth Scholars Forum, Ruijin Hospital, Shanghai, China (Online), 2026.