



Akshay Chaudhari

Assistant Professor (Research) of Radiology (Integrative Biomedical Imaging Informatics at Stanford) and, by courtesy, of Biomedical Data Science

CONTACT INFORMATION

- **Administrative Contact**

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Bio

BIO

Dr. Chaudhari is an Assistant Professor of research in the Integrative Biomedical Imaging Informatics at Stanford (IBIIS) section in the Department of Radiology. His primary research interests lie at the intersection of artificial intelligence and medical imaging. Dr. Chaudhari graduated from UCSD with a B.S. in Bioengineering in 2012. He completed his Ph.D. from Stanford University's Department of Bioengineering in 2017, focusing on novel MRI methods for musculoskeletal imaging; supported through the National Science Foundation Graduate Research Fellowship, the Whitaker Fellowship, and the Siebel Fellowship. Dr. Chaudhari trained as a postdoctoral fellow in Radiology at Stanford University, where he combined machine learning with medical imaging acquisition and analysis. Dr. Chaudhari has won many awards, including the W.S. Moore Young Investigator Award, the Junior Fellow Award, and an Outstanding Teacher Award from the ISMRM. He has 6 additional young investigator awards for his work on advanced medical imaging acquisition and analysis techniques. Dr. Chaudhari is the Associate Director of Research and Education at the Stanford AIMI Center and is an internal advisory board member of the Precision Health and Integrated Diagnostics Center.

ACADEMIC APPOINTMENTS

- Assistant Professor (Research), Radiology
- Assistant Professor (Research) (By courtesy), Department of Biomedical Data Science
- Member, Bio-X
- Faculty Affiliate, Institute for Human-Centered Artificial Intelligence (HAI)
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- Junior Fellow, International Society for Magnetic Resonance in Medicine (2020)
- W.S. Moore Young Investigator Award, International Society for Magnetic Resonance in Medicine (2019)
- Best Young Investigator Award, 12th Intl. Workshop on Osteoarthritis (2019)
- Best Emerging Investigator, Imaging Elevated Symposium (2019)
- 2nd - 'Best Science' Presentation, ISMRM and RSNA Workshop on Value in MRI (2018)
- 2nd - 'Best Value' Presentation, ISMRM and RSNA Workshop on Value in MRI (2018)

- 2x Magna Cum Laude Merit Award, International Society for Magnetic Resonance in Medicine Annual Meeting (2018)
- Best Healthcare Poster, NVIDIA GPU Technology Conference (2018)
- Best Junior Investigator Abstract, 11th Intl. Workshop on Osteoarthritis (2018)
- Best Overall Poster, NVIDIA GPU Technology Conference (2018)
- Editor's Monthly Pick, Magnetic Resonance in Medicine (2018)
- Outstanding Teacher Award, International Society for Magnetic Resonance in Medicine Annual Meeting (2018)
- Best Young Investigator Award, 10th Intl. Workshop on Osteoarthritis (2017)
- Biodesign NEXT Fellow, Stanford Biodesign (2017)
- Magna Cum Laude Merit Award, International Society for Magnetic Resonance in Medicine (2017)
- Best Young Investigator Award, 9th Intl. Workshop on Osteoarthritis (2016)
- Mobile Biodesign Innovation Award, Stanford Biodesign (2016)
- Siebel Scholar for Engineering Leadership, Siebel Foundation (2016)
- Award of Merit for Highly Rated Trainee Abstract, 8th Intl. Workshop on Osteoarthritis (2015)
- Whitaker International Program Summer Fellow, Whitaker Foundation (2015)
- Best Poster, Center for Biomedical Imaging at Stanford Symposium (2014)
- Graduate Research Fellow, National Science Foundation (2012)
- Best Undergraduate Research Poster, University of California San Diego Bioengineering Day (2011)
- Chuao Chocolate Alumni Scholar, University of California San Diego (2010)
- Most Informative Poster, Genentech Summer Intern Poster Expo (2010)
- Outstanding UCSD Junior, Genentech Process Research and Development (2010)
- Best Oral Presentation, Biomedical Engineering Society Lab Expo (2009)
- Gordon Scholar, Jacobs School of Engineering (UCSD) (2009)

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Dr. Chaudhari is interested in the application of artificial intelligence techniques to all aspects of medical imaging, including automated schedule and reading prioritization, image reconstruction, quantitative analysis, and prediction of patient outcomes. His interests range from developing novel data-efficient machine learning algorithms to clinical deployment and validation of patient outcomes, both for medical imaging acquisition and subsequent analysis. He is also exploring combining imaging with clinical, natural language, and time series data.

Teaching

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Anthony Gatti

Doctoral Dissertation Advisor (AC)

Arjun Desai

Postdoctoral Research Mentor

Peyman Shokrollahi

Publications

PUBLICATIONS

- **Low-count whole-body PET with deep learning in a multicenter and externally validated study.** *NPJ digital medicine*
Chaudhari, A. S., Mittra, E., Davidzon, G. A., Gulaka, P., Gandhi, H., Brown, A., Zhang, T., Srinivas, S., Gong, E., Zaharchuk, G., Jadvar, H.
2021; 4 (1): 127
- **The International Workshop on Osteoarthritis Imaging Knee MRI Segmentation Challenge: A Multi-Institute Evaluation and Analysis Framework on a Standardized Dataset.** *Radiology. Artificial intelligence*
Desai, A. D., Caliva, F., Iriondo, C., Mortazi, A., Jambawalikar, S., Bagci, U., Perslev, M., Igel, C., Dam, E. B., Gaj, S., Yang, M., Li, X., Deniz, et al
2021; 3 (3): e200078
- **Accuracy and longitudinal reproducibility of quantitative femorotibial cartilage measures derived from automated U-Net-based segmentation of two different MRI contrasts: data from the osteoarthritis initiative healthy reference cohort.** *Magma (New York, N.Y.)*
Wirth, W., Eckstein, F., Kemnitz, J., Baumgartner, C. F., Konukoglu, E., Fuerst, D., Chaudhari, A. S.
2020
- **Prospective Deployment of Deep Learning in MRI: A Framework for Important Considerations, Challenges, and Recommendations for Best Practices.** *Journal of magnetic resonance imaging : JMRI*
Chaudhari, A. S., Sandino, C. M., Cole, E. K., Larson, D. B., Gold, G. E., Vasanawala, S. S., Lungren, M. P., Hargreaves, B. A., Langlotz, C. P.
2020
- **Diagnostic Accuracy of Quantitative Multi-Contrast 5-Minute Knee MRI Using Prospective Artificial Intelligence Image Quality Enhancement.** *AJR. American journal of roentgenology*
Chaudhari, A. S., Grissom, M. J., Fang, Z. n., Sveinsson, B. n., Lee, J. H., Gold, G. E., Hargreaves, B. A., Stevens, K. J.
2020
- **Rapid Knee MRI Acquisition and Analysis Techniques for Imaging Osteoarthritis.** *Journal of magnetic resonance imaging : JMRI*
Chaudhari, A. S., Kogan, F., Podoia, V., Majumdar, S., Gold, G. E., Hargreaves, B. A.
2019
- **Utility of deep learning super-resolution in the context of osteoarthritis MRI biomarkers.** *Journal of magnetic resonance imaging : JMRI*
Chaudhari, A. S., Stevens, K. J., Wood, J. P., Chakraborty, A. K., Gibbons, E. K., Fang, Z., Desai, A. D., Lee, J. H., Gold, G. E., Hargreaves, B. A.
2019
- **Combined 5-minute double-echo in steady-state with separated echoes and 2-minute proton-density-weighted 2D FSE sequence for comprehensive whole-joint knee MRI assessment** *JOURNAL OF MAGNETIC RESONANCE IMAGING*
Chaudhari, A. S., Stevens, K. J., Sveinsson, B., Wood, J. P., Beaulieu, C. F., Oei, E. G., Rosenberg, J. K., Kogan, F., Alley, M. T., Gold, G. E., Hargreaves, B. A.
2019; 49 (7): E183–E194
- **Super-resolution musculoskeletal MRI using deep learning.** *Magnetic resonance in medicine*
Chaudhari, A. S., Fang, Z., Kogan, F., Wood, J., Stevens, K. J., Gibbons, E. K., Lee, J. H., Gold, G. E., Hargreaves, B. A.
2018
- **Five-minute knee MRI for simultaneous morphometry and T2 relaxometry of cartilage and meniscus and for semiquantitative radiological assessment using double-echo in steady-state at 3T.** *Journal of magnetic resonance imaging : JMRI*
Chaudhari, A. S., Black, M. S., Eijgenraam, S. n., Wirth, W. n., Maschek, S. n., Sveinsson, B. n., Eckstein, F. n., Oei, E. H., Gold, G. E., Hargreaves, B. A.
2018; 47 (5): 1328–41
- **Deep Learning Super-Resolution Enables Rapid Simultaneous Morphological and Quantitative Magnetic Resonance Imaging**
Chaudhari, A., Fang, Z., Lee, J., Gold, G., Hargreaves, B., Knoll, F., Maier, A., Rueckert, D.
SPRINGER INTERNATIONAL PUBLISHING AG.2018: 3–11
- **connective tissues in the knee using ultrashort echo-time double-echo steady-state (UTEDESS).** *Magnetic resonance in medicine*
Chaudhari, A. S., Sveinsson, B., Moran, C. J., McWalter, E. J., Johnson, E. M., Zhang, T., Gold, G. E., Hargreaves, B. A.
2017
- **Author Correction: Low-count whole-body PET with deep learning in a multicenter and externally validated study.** *NPJ digital medicine*
Chaudhari, A. S., Mittra, E., Davidzon, G. A., Gulaka, P., Gandhi, H., Brown, A., Zhang, T., Srinivas, S., Gong, E., Zaharchuk, G., Jadvar, H.

2021; 4 (1): 139

- **Open Source Software for Automatic Subregional Assessment of Knee Cartilage Degradation Using Quantitative T2 Relaxometry and Deep Learning.** *Cartilage*
Thomas, K. A., Krzeminski, D., Kidzinski, L., Paul, R., Rubin, E. B., Halilaj, E., Black, M. S., Chaudhari, A., Gold, G. E., Delp, S. L.
2021: 19476035211042406
- **Synthesizing Quantitative T2 Maps in Right Lateral Knee Femoral Condyles from Multicontrast Anatomic Data with a Conditional Generative Adversarial Network.** *Radiology. Artificial intelligence*
Sveinsson, B., Chaudhari, A. S., Zhu, B., Koonjoo, N., Torriani, M., Gold, G. E., Rosen, M. S.
2021; 3 (5): e200122
- **Challenges in ensuring the generalizability of image quantitation methods for MRI.** *Medical physics*
Keenan, K. E., Delfino, J. G., Jordanova, K. V., Poorman, M. E., Chirra, P., Chaudhari, A. S., Baessler, B., Winfield, J., Viswanath, S. E., deSouza, N. M.
2021
- **Sarcopenia in rheumatic disorders: what the radiologist and rheumatologist should know.** *Skeletal radiology*
Manzano, W., Lenchik, L., Chaudhari, A. S., Yao, L., Gupta, S., Boutin, R. D.
2021
- **Non-contrast MRI of synovitis in the knee using quantitative DESS.** *European radiology*
Thoenen, J., Stevens, K. J., Turmezei, T. D., Chaudhari, A., Watkins, L. E., McWalter, E. J., Hargreaves, B. A., Gold, G. E., MacKay, J. W., Kogan, F.
2021
- **Measuring Robustness in Deep Learning Based Compressive Sensing**
Darestani, M., Chaudhari, A. S., Heckel, R., Meila, M., Zhang, T.
JMLR-JOURNAL MACHINE LEARNING RESEARCH.2021
- **Improving in vivo human cerebral cortical surface reconstruction using data-driven super-resolution.** *Cerebral cortex (New York, N.Y. : 1991)*
Tian, Q., Bilgic, B., Fan, Q., Ngamsombat, C., Zaretskaya, N., Fultz, N. E., Ohringer, N. A., Chaudhari, A. S., Hu, Y., Witzel, T., Setsompop, K., Polimeni, J. R., Huang, et al
2020
- **Layer-specific analysis of femorotibial cartilage t2 relaxation time based on registration of segmented double echo steady state (dess) to multi-echo-spin-echo (mese) images.** *Magma (New York, N.Y.)*
Furst, D., Wirth, W., Chaudhari, A., Eckstein, F.
2020
- **Preoperative MRI of Articular Cartilage in the Knee: A Practical Approach.** *The journal of knee surgery*
Fritz, R. C., Chaudhari, A. S., Boutin, R. D.
2020; 33 (11): 1088–99
- **MRSaiFE: Tissue Heating Prediction for MRI: a Feasibility Study**
Winkler, S., Saniour, I., Chaudhari, A., Robb, F., Vaughan, J., IEEE
IEEE.2020
- **A Deep Learning Automated Segmentation Algorithm Accurately Detects Differences in Longitudinal Cartilage Thickness Loss - Data from the FNIH Biomarkers Study of the Osteoarthritis Initiative.** *Arthritis care & research*
Eckstein, F. n., Chaudhari, A. S., Fuerst, D. n., Gaisberger, M. n., Kemnitz, J. n., Baumgartner, C. F., Konukoglu, E. n., Hunter, D. J., Wirth, W. n.
2020
- **Time-saving opportunities in knee osteoarthritis: T2 mapping and structural imaging of the knee using a single 5-min MRI scan.** *European radiology*
Eijgenraam, S. M., Chaudhari, A. S., Reijman, M., Bierma-Zeinstra, S. M., Hargreaves, B. A., Runhaar, J., Heijboer, F. W., Gold, G. E., Oei, E. H.
2019
- **Evaluation of a Flexible 12-Channel Screen-printed Pediatric MRI Coil** *RADIOLOGY*
Winkler, S., Corea, J., Lechene, B., O'Brien, K., Bonanni, J., Chaudhari, A., Alley, M., Taviani, V., Grafendorfer, T., Robb, F., Seem, G., Pauly, J., Lustig, et al
2019; 291 (1): 179–84
- **Simultaneous NODDI and GFA parameter map generation from subsampled q-space imaging using deep learning** *MAGNETIC RESONANCE IN MEDICINE*

Gibbons, E. K., Hodgson, K. K., Chaudhari, A. S., Richards, L. G., Majersik, J. J., Adluru, G., DiBella, E. R.
2019; 81 (4): 2399–2411

- **Clinical evaluation of fully automated thigh muscle and adipose tissue segmentation using a U-Net deep learning architecture in context of osteoarthritic knee pain.** *Magma (New York, N.Y.)*

Kemnitz, J. n., Baumgartner, C. F., Eckstein, F. n., Chaudhari, A. n., Ruhdorfer, A. n., Wirth, W. n., Eder, S. K., Konukoglu, E. n.
2019

- **3D Ultrashort TE MRI for Evaluation of Cartilaginous Endplate of Cervical Disk In Vivo: Feasibility and Correlation With Disk Degeneration in T2-Weighted Spin-Echo Sequence** *AMERICAN JOURNAL OF ROENTGENOLOGY*

Kim, Y., Cha, J., Shin, Y., Chaudhari, A. S., Suh, Y., Yoon, S., Gold, G. E.
2018; 210 (5): 1131–40

- **Simultaneous bilateral-knee MR imaging.** *Magnetic resonance in medicine*

Kogan, F. n., Levine, E. n., Chaudhari, A. S., Monu, U. D., Epperson, K. n., Oei, E. H., Gold, G. E., Hargreaves, B. A.
2018; 80 (2): 529–37

- **A simple analytic method for estimating T2 in the knee from DESS.** *Magnetic resonance imaging*

SVEINSSON, B., Chaudhari, A. S., Gold, G. E., Hargreaves, B. A.
2016; 38: 63-70