Stanford



Chaoyu Lei

Postdoctoral Scholar, Ophthalmology

Bio

BIO

Dr. Chaoyu Lei is a Postdoctoral Scholar in the Department of Ophthalmology at Stanford University School of Medicine, working with Dr. Andrea L. Kossler. As a physician-scientist and Professional Member of the International Thyroid Eye Disease Society, his research focuses on the clinical and translational study of thyroid eye disease (TED) using ocular imaging.

His work integrates clinical ophthalmology and digital health to improve the objective assessment and management of TED. His research includes the development and clinical evaluation of digital tools for ocular sign detection and quantification, disease identification and phenotyping, and treatment-response prediction. His broader interests include trustworthy medical implementation, health equity, and the responsible clinical deployment of digital technologies.

Dr. Lei received his MD degree from Shanghai Jiao Tong University. He serves as a Reviewing Editor & Trusted Reviewer for Springer Nature's Reviewer Communities, and as a reviewer for leading journals in ophthalmology. He was also selected for the United Nations University Digital Technology and Sustainable Development Talent Programme. He has presented his work at major international meetings, including AAO, WOC, and APAO.

Outside of work, he enjoys tennis, cycling, swimming, and trying new recipes in the kitchen.

HONORS AND AWARDS

- Best Scientific Paper, The 41st Asia-Pacific Academy of Ophthalmology Congress (02/06/2026)
- Young Innovator Travel Grant, The 10th Asia Pacific Tele-Ophthalmology Society Symposium (06/27/2025)
- Runner-up Award, Doctoral Forum of U21 Health Science Group (08/25/2024)
- Bronze Poster Award, Nature Conferences (04/29/2024)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Reviewing Editor, Springer Nature's Reviewer Communities (2025 - present)
- Professional member, International Thyroid Eye Disease Society (2024 - present)

STANFORD ADVISORS

- Andrea Kossler, Postdoctoral Faculty Sponsor

Research & Scholarship

RESEARCH INTERESTS

- Assessment & Evaluation
- Data Science

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Thyroid eye disease; Ocular imaging; Clinical research; Digital health

Publications

PUBLICATIONS

- **Artificial intelligence in orbital diseases: opportunities, challenges, and future horizons.** *Survey of ophthalmology*
  Lei, C., Zhao, C., Guo, S., Sintuwong, S., Yip, C. C., Chong, K. K., Lai, K. K., Zheng, Z., Shen, F., Ren, Y., Duan, X., Allen, R. C., Zhou, et al
  2026
- **Innovative orbital rim repositioning with mortise-tenon joints: a fusion of modern surgery and traditional Chinese woodcraft.** *Orbit (Amsterdam, Netherlands)*
  Lei, C., Zhang, S., Sun, J., Zhang, N., Yip, C. C., Zhou, H., Li, Y.
  2026: 1-9
- **ProptoView: AI-based digital exophthalmometry using multi-view facial images in a multinational validation study.** *Journal of translational medicine*
  Lei, C., Song, S., Fan, J., Pandiyan, P. S., Ding, J., Wattanaphanich, S., Liu, X., Lu, W., Wei, D., Zhang, S., Zhou, M., Su, J., Lyu, et al
  2026; 24 (1)
- **Centering the marginalized: AI-driven strategies for advancing health equity in rare disease care.** *Patterns (New York, N.Y.)*
  Lei, C., Zuo, Y., Lopes, C. A., Stuart, J., Xu, B., Liu, T. Y., Ploug, T., Wang, Z., Dang, K., Jin, K., Yu, H., Tatere, H. Y., Kong, et al
  2026; 7 (5): 101535
- **Benchmarking clinical knowledge and multi-modal reasoning of large language models in liver cirrhosis** *SCIENTIFIC REPORTS*
  Zhang, Y., Chen, H., Xu, R., Lei, C., Han, D., Li, Y., Wang, X.
  2026; 16 (1)
- **Evaluating and enhancing the performance of large language models in thyroid eye disease through customization and Chain-of-Thought strategies.** *Scientific reports*
  Lei, C., Zhao, C., Ji, K., Cao, C., Chen, H., Wei, D., Zhang, S., Guo, S., Li, R., Zhong, S., Song, X., Zhai, G., Hoi, et al
  2026; 16 (1)
- **Camurati-Engelmann disease with bilateral proptosis and optic neuropathy: a case report and literature review.** *Orbit (Amsterdam, Netherlands)*
  Lei, C., He, Z., Liang, Y., Li, Y., Zhao, S. X., Qiao, J., Zhou, H.
  2026: 1-8
- **Management of Thyroid Eye Disease: A Comparison Between Three Recent Clinical Guidelines.** *Ophthalmology and therapy*
  Lei, C., Jin, J., Li, R., Yip, C. C., Chong, K. K., Smith, T. J., Sun, J., Zhou, H.
  2026; 15 (3): 985-999
- **Sequential sensitivity analysis of multimodal large language models for rare orbital disease detection.** *Communications medicine*
  Lei, C., Ji, K., Zhao, C., Zhong, S., Cao, C., Chen, H., Yip, C. C., Sintuwong, S., Ding, J., Pandiyan, P. S., Wattanaphanich, S., Johnston, L., Ren, et al
  2026; 6 (1)
- **Enhancing ocular sign detection: AI-based strategic segmentation for improved accuracy and privacy protection.** *NPJ digital medicine*
  Lei, C., Zhao, C., Chen, J., Duan, X., Xu, C., Yip, C. C., Sintuwong, S., Ding, J., Pandiyan, P. S., Wattanaphanich, S., Ren, Y., Luo, S., Song, et al
  2026; 9 (1): 130

- **Quantitative analysis of conjunctival vascular alterations: Applications in ocular and systemic disease detection.** *Progress in retinal and eye research*
  Duan, X., Lei, C., Lim, C. H., Ding, J., Mehta, J. S., Basu, S., Johnston, L., Ren, Y., Zhao, C., Chang, V. K., Zhou, H.
  2026; 110: 101416
- **ROFI: a deep learning-based ophthalmic sign-preserving and reversible patient face anonymizer.** *NPJ digital medicine*
  Tian, Y., Zhou, M., Chen, Y., Li, F., Qi, L., Wang, S., Xu, X., Yu, Y., Xu, S., Lei, C., Jiang, Y., Zhang, R., Tan, et al
  2025; 8 (1): 705
- **Clinical Features of Chinese Patients with Thyroid Eye Disease: A Multicenter Retrospective Study.** *Thyroid : official journal of the American Thyroid Association*
  Lei, C., Lyu, X., Ren, Y., Wei, D., Zhang, S., Zhang, Y., Wang, L., Liu, L., Wen, J., Liu, X., Lin, C., Lu, W., Liu, et al
  2025; 35 (10): 1187-1197
- **Integrating ocular and clinical features to enhance intravenous glucocorticoid response prediction in thyroid eye disease: a machine learning approach.** *Endocrine*
  Zhao, C., Lei, C., Pei, S., Ren, Y., Duan, X., Guo, S., Song, X., Wang, H., Zhou, H.
  2025; 90 (1): 188-198
- **Penetrating orbital injury by a nine-centimetre lead sinker.** *BMJ case reports*
  Lei, C., Li, Y., Zhou, H., Zhong, S.
  2025; 18 (7)
- **A novel spatial-temporal image fusion method for augmented reality-based endoscopic surgery.** *Medical image analysis*
  Shi, H., Xu, J., Li, H., Jiang, S., Lei, C., Zhou, H., Li, Y., Chen, X.
  2025; 103: 103609
- **Reshaping the hierarchical medical system for rare diseases: a two-tier structure and one-stop referral network.** *Journal of global health*
  Lei, C., Zuo, Y., Kong, F., Chen, H., Cheng, H., Song, X., Zhang, L., Zhou, H.
  2025; 15: 03005
- **AI-assisted facial analysis in healthcare: From disease detection to comprehensive management.** *Patterns (New York, N.Y.)*
  Lei, C., Dang, K., Song, S., Wang, Z., Chew, S. P., Bian, R., Yang, X., Guan, Z., Lopes, C. I., Wang, M. H., Choy, R. W., Hu, X., Lai, et al
  2025; 6 (2): 101175
- **Research beneficiaries speak.** *Science (New York, N.Y.)*
  Ye, Q., Gao, Y., Patel, R. J., Cao, B., Li, A., Powell, J., Cai, Y., Marín-Beltrán, I., Tao, Z., Ejaz, M., Zaidi, S. S., Gupta, A., See, et al
  2024; 384 (6691): 26-28
- **Revisiting global health education: The engagement of medical students.** *Journal of global health*
  Lei, C., Zhou, H., Qu, M., Cheng, H., Tao, Z., Song, X., Zhou, H., Zhang, L.
  2023; 13: 03059
- **Facial expression of patients with Graves' orbitopathy.** *Journal of endocrinological investigation*
  Lei, C., Qu, M., Sun, H., Huang, J., Huang, J., Song, X., Zhai, G., Zhou, H.
  2023; 46 (10): 2055-2066
- **Layperson?s performance on an unconversant type of AED device: A prospective crossover simulation experimental study** *WORLD JOURNAL OF EMERGENCY MEDICINE*
  Lei, C., Qin, H., Dong, X., You, J., Zhang, L.
  2022; 13 (2): 98-105
- **A clinical decision model based on machine learning for ptosis.** *BMC ophthalmology*
  Song, X., Tong, W., Lei, C., Huang, J., Fan, X., Zhai, G., Zhou, H.
  2021; 21 (1): 169
- **Mechanistic insights into the effect of phosphorylation on Ras conformational dynamics and its interactions with cell signaling proteins** *COMPUTATIONAL AND STRUCTURAL BIOTECHNOLOGY JOURNAL*
  Wang, Y., Ji, D., Lei, C., Chen, Y., Qiu, Y., Li, X., Li, M., Ni, D., Pu, J., Zhang, J., Fu, Q., Liu, Y., Lu, et al
  2021; 19: 1184-1199