Chenyuan Li, DDS, PhD, MS
Academic Researcher in Dental Informatics and Healthcare AI
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PERSONAL STATEMENT

Dr. Chenyuan Li, DDS, PhD, MS, is an academic researcher with formal training in dentistry, biomedical informatics, and healthcare AI. The research focuses on foundation models for dental and medical EHRs, multimodal AI for clinical decision support, and translational AI in precision dentistry. The long-term goal is to establish an independent research program advancing AI-driven digital dentistry and healthcare innovation.

EDUCATION

Master of Science in Biomedical Informatics ***Aug.2024-Now***
The University of Texas Health Science Center at Houston Houston, TX, USA
Research Training: Digital health analytics, healthcare artificial intelligence, deep learning for clinical data, large-scale data science, biostatistics, and grant writing in biomedical research.

PhD in Medical and Dental Sciences **Apr.2020-Mar.2024**
Tokyo Medical and Dental University, Graduate School of Medical and Dental Science Tokyo, Japan
Research Focus: Sports dentistry, oral implantology, regenerative dental medicine, advanced biomaterials, and dental engineering, with emphasis on digital dentistry and translational research.

***Research Student* in Maxillofacial Prosthodontics** **Oct.2019-Mar.2020**
Tokyo Medical and Dental University, Graduate School of Medical and Dental Science Tokyo, Japan
Training: Clinical and research exposure in maxillofacial prosthodontics and digitally assisted prosthetic design.

Bachelor of Medicine in Stomatology (DDS in Dentistry) **Sep.2014-Jun.2019**
Lishui University, School of Medicine and Health Lishui, China
Clinical and Scientific Training: Comprehensive dental education including orthodontics, oral and maxillofacial surgery, oral microbiology, clinical pharmacology, immunology, biochemistry, medical biology, and histoembryology.

WORK EXPERIENCES

Postdoctoral Research Fellow/Graduate Research Assistant **Aug.2024-Now**
The University of Texas Health Science Center at Houston Texas, United States

- **Dental Foundation Model Development (BigMouth Project)**
  - Conceived and led the BigMouth Project, one of the first initiatives to develop foundation models for large-scale dental electronic health records (EHRs), and prepared associated IRB protocols and grant applications.
  - Designed the overall research framework for large-scale pretraining on multi-million–patient datasets and downstream clinical prediction tasks, including data curation, quality control, and multimodal data integration into unified embedding representations.
  - Developed and refined model architectures and training strategies for both pretraining and downstream tasks, and systematically benchmarked deep learning approaches against classical machine learning baselines.
  - Established a clinical–AI translation framework by defining key dental clinical tasks (e.g., periodontitis classification and implant outcome prediction) and constructing customized dental terminology dictionaries to improve clinical context modeling.
  - Engineered scalable, multi-institutional data pipelines integrating records from more than 10 institutions (>4 million patients), implementing transformer-based (MedEncoder) and state-space (Mamba) architectures for longitudinal and temporal learning.
  - Demonstrated robust cross-institutional generalization, supporting the potential of foundation-model–based approaches for clinical decision support and automated dental chart review.
- **AI-Driven Digital Health Analytics**
  - Conducted methodological research on the use of pretrained and generative language models to identify cognitive patterns in large-scale social media data, grounded in Beck's cognitive theory, resulting in a manuscript prepared for submission.

- Systematically evaluated transfer learning and prompting-based strategies for supervised classification tasks, exploring the use of pretrained language models and large language models to improve model interpretability and generalizability in mental health–related data.
- Extended AI methodologies to additional healthcare domains, including medical imaging–based retinal disease detection and structured EHR-based cancer subtype stratification, demonstrating cross-domain applicability of machine learning approaches.
- Developed scalable data processing and modeling workflows for large clinical datasets using distributed computing frameworks, and applied classical machine learning models for outcome prediction and subgroup discovery.
- Designed interactive data visualization and analytics dashboards to support exploratory analysis, performance monitoring, and clinical insight generation in digital health research.

Teaching Assistant and PhD Researcher **Apr.2020-Mar.2024**
Tokyo Medical and Dental University Tokyo, Japan

- Initiated and led interdisciplinary (engineering–clinical) research projects from concept development to grant application, integrating CAD/CAM workflows and additive manufacturing to design and fabricate 3D-printed sports mouthguards, followed by mechanical optimization, durability testing, and clinical protocol development.
- Conducted rigorous statistical analyses using SPSS and R to evaluate the safety and performance of dental polymer materials, applying Design of Experiments (DOE) methodologies to systematically optimize material formulations.
- Managed end-to-end academic research projects from hypothesis formulation through experimental validation and peer-reviewed publication, contributing to multiple Q1 journal articles in digital dentistry, dental materials, and 3D modeling.
- Disseminated research findings through presentations at more than 10 international conferences, contributing to scholarly discourse and advancing innovation in digital dentistry.

Dentist **Jun.2018-Sep.2019**
Zhejiang Hospital Hangzhou, China

- Provided comprehensive clinical dental care, including restorative dentistry, tooth extractions, and assistance in dental implant surgeries, gaining firsthand exposure to real-world clinical workflows and unmet needs in dental care delivery.

Research Assistant **Jul.2017-Aug.2017**
Chinese Academy of Sciences Shanghai, China

- Assisted in in vivo cancer research involving the development of luciferase-labeled orthotopic xenograft mouse models, contributing to experimental design, data collection, and biological validation.

ACADEMIC SERVICE & SCHOLARLY ACTIVITIES

Young Editor Board Member ***Jan.2026-Now***
International Journal of Bioprinting Online

- Participate in editorial activities including manuscript assessment, coordination of peer review, and evaluation of scientific rigor and relevance in the fields of bioprinting, digital manufacturing, and biomedical engineering.
- Contribute to journal-related academic activities, including editorial discussions and community engagement initiatives conducted in an online setting.

METHODS & TECHNICAL EXPERTISE

Quantitative and Statistical Methods

Biostatistics, regression and classification models, survival analysis, causal inference, and experimental design.

Machine Learning and Artificial Intelligence

Machine learning and deep learning methods for healthcare data, including transformer-based architectures, temporal modeling, representation learning, and foundation model pretraining and fine-tuning.

Clinical and Multimodal Data Analysis

Large-scale EHR data analysis, multimodal data integration (structured data, text, imaging), and longitudinal modeling across multi-institutional datasets.

Computational Tools

Python, R, SQL (BigQuery), PySpark, Apache Spark; data analysis and visualization using Tableau, ggplot2, and Matplotlib.

Digital Dentistry and 3D Technologies

CAD/CAM workflows and 3D design tools for digital dentistry and biomedical applications.

Languages

English (Fluent), Japanese (Professional working proficiency), Mandarin Chinese (Native).

AWARD

Research Fellowships and Scholarships

Michael & Gillian McCord Scholarship Award from UTHealth Houston

WISE Scholarship for Supporting Pioneering Research by the Next Generation, Japan Science and Technology Agency (JST)

Honors Scholarship for students with excellent academic records from Japan Student Services Organization

Conference and Academic Awards

Award of Oral Presentation: Neo Pharmaceutical Industry Award in Japanese Academy of Sports Dentistry

PUBLICATIONS

- **Chenyuan Li**, Hongfang Liu, Ming Huang et al, Accurate classification of Beck's cognitive patterns of social media users by leveraging pretrained language models and generative large language models (review)
- Idris SS, Churei H, **Li CY**, et al. Impact Absorption on The 3D Printed Mouthguard Material in Selected Printing Angulations Dental Traumatology (Under review) 2026.01
- **Li C**, Wada T, Tsuchida Y, et al. Optimizing additively manufactured mouthguards: An evaluation of multi-layer materials for improved shock absorption and durability compared to conventionally fabricated samples. International Journal of Bioprinting. 2024;10(3)doi:10.36922/ijb.2469
- Aung TK, Churei H, **Li C**, et al. Shock absorption of 3D-printed ABS and fabric for sports faceguard. International Dental Journal. 2021/09/01/ 2021;71:S47-S48. doi.org/10.1016/j.identj.2021.08.041
- Aung TK, Churei H, **Li C**, et al. Air Permeability, Shock Absorption Ability, and Flexural Strength of 3D-Printed Perforated ABS Polymer Sheets with 3D-Knitted Fabric Cushioning for Sports Face Guard Applications. Polymers (Basel). Jun 5 2021;13(11)doi:10.3390/polym13111879
- Gen T, **Li C**, et al. Systematic Review of the Advances and Applications of Digital Dentistry in Sports Mouthguard Fabrication. International Journal of Sports Dentistry 2023
- Churei H, **Li C**, et al. A Literature Review on the Application of 3D Modeling Techniques to Mouthguard Fabrication. International Journal of Sports Dentistry 2023

PRESENTATIONS

- **Chenyuan Li,** Hiroshi Churei, et al. Evaluation of shock absorption in various designed 3D printed samples Evaluation of shock absorption in various designed 3D printed samples. 2024 IADR/ AADOCR/ CADR General Session & Exhibition, New Orleans, USA
- **Chenyuan Li**. Retention force comparison of 3D multiple layer mouthguard and conventional mouthguard via cycle-loading durability fatigue test. The 34th Annual Meeting of the Japanese Academy of Sports Dentistry, Nov 18, 2023, Fukuoka, Japan
- **Chenyuan Li,** Hiroshi Churei, Chang Liu, Qiushuang Zhu, Zequn Li, Gen Tanabe, Toshiaki Ueno.Questionnaire survey on safety awareness for boxers in China. 2022 IADR (100th)/IADR APR(5th)，JUNE 20-25, 2022, Virtual Experience.
- **Chenyuan Li,** Hiroshi Churei, Toshiaki Ueno, et al. Impact absorption and distribution ability of 3D printed mouthguard material in contrasting orientations. The 78th General Session of the Japanese Society for Dental Materials and Devices, Online
- Gen Tanabe, Atsushi Iwaki, **Chenyuan Li,** et al. 3D printing of a shape memory photopolymer device with the use of a virtual articulator that has been designed on the basis of oral scan data and jaw movement data. The 35th Annual Meeting of the Japanese Academy of Sports Dentistry, Oct 12, 2024, Osaka, Japan
- Aung Thida, Hiroshi Churei, **Chenyuan Li,** et al. Simultaneous measurement of salivary pH using sensors at multiple sites. The 35th Annual Meeting of the Japanese Academy of Sports Dentistry, Oct 12, 2024, Osaka, Japan
- Aung Thet Khaing, Hiroshi Churei, **Chenyuan Li,** et al. Shock absorption of 3D-printed ABS and fabric for sports faceguard. FDI 2021World Dental Federation, May 2021, Sydney, Australia
- Yumi Takahashi, Hiroshi Churei, **Chenyuan Li,** et al, Application of custom-made faceguard for professional volleyball player after jaw surgery of surgical orthodontic treatment. The 31st Annual Meeting of the Japanese Academy of Sports Dentistry, Hiroshima & Online
- Shintaro Shimizu, **Chenyuan Li**, Toshiaki Ueno et al. Clarifying the Mechanisms of School Sports Accidents Using Text Mining. The 24th Scientific Meeting of the Japanese Association for Dental Science, Online