Jonathan H. Chen, MD, PhD

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Education / Academics

Stanford Department of Medicine *November 2015 - Present*
- Instructor, Division of General Medical Disciplines

Clinical Practice (20%)
- ClickWell Care, Primary Care and Telehealth Clinic
- Hospitalist Division, Inpatient Attending

Funding & Awards
- NIH Big Data 2 Knowledge K01 - Mentored Career Development Award in Biomedical Data Science, NIEHS, K01ES026837 (2015-2020)
- SGIM California-Hawaii Research Competition, Second Place (2016)

Veteran Affairs Palo Alto + Stanford *July 2014 – October 2015*
- Fellowship in Medical Informatics
- VA Center for Innovation to Implementation (Ci2i)
- Stanford Primary Care and Outcomes Research (PCOR) (90% Post-Doc)
- Stanford Department of Medicine (10% Clinical Instructor)

Awards & Accomplishments
- Stanford Health Care Innovation Challenge seed grant (PI) (2015-2016) *Only post-doctoral fellow to secure grant as the project PI*
- AMIA Joint Summits on Translational Science, Best Student Paper, Finalist (2015)
- ACP Northern California Research Competition, First Place (2015)
- Completed fellowship early after successfully applying for NIH BD2K K01

Stanford University Hospital *June 2011 - June 2014*
- Internal Medicine Residency
- California Medical License #A122045 (7/2012-)
- Internal Medicine Board Certified (10/2014-)
- US Medical Licensing Exam (USMLE) Step 3: 243(99) (2011)
- Resident Informatics Council Representative

Awards & Activities
- Stanford Translational Research and Applied Medicine (TRAM) Grant (2012-2015) *First resident to receive and competitively renew grant*

- Resident Teaching Award, Nominated (2012-2013)
- AMIA Joint Summits on Translational Science, Best Student Paper (2014)
- Clinical Templates and Online Calculators
    - Developed clinical assessment and plan templates, voluntary adopted by dozens of other medical residents and students
    - Web-based (HTML/JavaScript) calculators for medical problems
        - Acid-Base analyzer adopted by MDCalc.com and Epic
    - http://web.stanford.edu/~jonc101/tools/

University of California, Irvine *Fall 2002 – June 2011*

- MD (2011), PhD (2009)
- Medical Scientist Training Program
- School of Medicine
- School of Information & Computer Science
- Institute for Genomics and Bioinformatics

Funding

- UCI Medical Scientist Training Grant (NIH) (2002-2011)
- Bioinformatics Training Grant (NLM/NIH) (2006-2009)
- Orange County ARCS Foundation Scholarship (2005-2007)

Honors & Awards

- Graduated with Distinctions in Research and Service (2011)
- Alpha Omega Alpha Honor Medical Society (Junior Inductee 2010)
- CINF Scholarship for Scientific Excellence (Fall 2008, Spring 2009)
- UCI MSTP Research Presentation Award (2007, 2008)
  Awarded for best student presentation of the MSTP, 2 consecutive years.
- Educational Affairs Service Award (2004-2005)
  For development of medical elective scheduling system
- US Medical Licensing Exam (USMLE) Step 2 CK: 256(99) (2010)
- US Medical Licensing Exam (USMLE) Step 1: 255(99) (2004)
- Basic Sciences Certificate of Excellence (2002-2003)

Extracurricular Projects & Activities

- Medical Elective Scheduling System
    - Self-initiated design and development of a Web-accessible medical student rotation scheduling system.
    - Directly addressed years of student complaints of a manual system requiring scheduled administrator meeting for every action.
- Medical Scholars Program Exam Archive & Online Assignment System
    - Medical student cooperative learning system
    - Enhanced exam archive with online cooperative learning workflow
- Clinica Carino Patient Tracking DB
    - Developed patient record system for community free clinic
    - Enabled patient follow up and population research analysis

University of California, Los Angeles *Fall 1996 – Winter 2000*

- B.S. Cybernetics with Specialization in Computer Studies
- GPA: 3.90
- Medical College Admissions Test: 13/14/13 (99th percentile) (1998)
- College Honors, Departmental Honors, Summa Cum Laude
- Dean's List (1997-1998)

California State University of Los Angeles *Fall 1994 – Summer 1996*

- Dean's List (1994-1995, 1995-1996)
- Honor's Student of the Year, Nominated (1994-1995)
- Selected into Early Entrance Program: *Began full-time college at age 13*

Work Experience

Reaction Explorer LLC *Winter 2010 - Present*

Chief Executive Officer and Founding Partner

- Original inventor of underlying technology from graduate research project
- Partnered with Wiley publishing for ongoing worldwide distribution

Stanford Express Care Clinic *Summer 2014 – Winter 2015*

Physician, Same-day Clinic (part-time)

Palo Alto Medical Foundation *Summer 2014 – Winter 2015*

Physician, Nocturnist (part-time)

20th Century Fox, Information Tech. *Summer 2001 – Summer 2002*

Software Developer: Accounts Receivable, Contract Maintenance Application

Trilogy Software *Summer 2000 – Spring 2001*

Software Engineer / Quality Engineer

20th Century Fox, Information Tech *Summer 1999 – Winter 2000*

Software Developer: "Atlas" Home Entertainment International Sales Forecasting

Research Experience

Stanford, Dept. of Medicine *2012-2015*

Post-Doctoral Research in Altman Lab, Mining EMRs for Clinical Expertise

UC Irvine, Dept. of Computer Science *Summer 2004 – Spring 2009*

Graduate Student in Baldi Lab, Chemoinformatics Data Systems

UC Irvine, Dept. of Computer Science *Summer 2003*

Graduate Student in Lathrop Lab, Computational, Functional Modeling of p53

UCLA Brain Research Institute *Summer 1998 – Spring 1999*

Research Student in Schlag Lab, Visual Cortex Mapping and Analysis

Teaching and Mentoring Experience

Recent Trainees Mentored

- Gustavo Chavez, MS1. Supervised his Leaders in Health Disparities Summer research program → Posters at SGIM and ACP regional meetings 2015.
- Muthu Alagappan, MS4. Supervised clinical analysis algorithm development
- Albee Ling, BMI PhD student. Helped develop thesis proposal topic
- Anne Smeraglio and Zoe Quandt, PGY3. Created text extraction software and advice to support hospital readmissions research
- Ron Li, PGY2. Research and technical mentorship as he evaluates the impact of problem-based medical charting.
- Daniel Fang, former PGY3 → Journal of Hospital Medicine 2015
- David Ouyang, PGY2 → JAMA Internal Medicine 2015 and American Journal of Medicine 2016

Resident Teaching Award, Nominated (2012-2013)

- Produced clinical assessment and plan templates and online calculators used by dozens of residents and medical students

Reaction Explorer

- Created novel online teaching system that allowed for inquiry-based learning with “unlimited replay value” by algorithmically generating complex organic chemistry problems on-demand
- Teaching assistance supporting deployment (2008-2009)

UC Irvine Medical Student Tutor (2004-2005)
Kumon Math Center Tutor (1995)

Peer-Reviewed Publications

1. **Chen, J.H.**, Hom, J., Richman, I., Asch, S.M., Podchiyska, T., Atwan Johansen, N., Effect of Opioid Prescribing Guidelines in Primary Care, *Medicine* (2016) (Accepted)
2. **Chen, J.H.**, Goldstein, M.K., Asch, S.M., Mackey, L., Altman, R.B., Predicting Inpatient Clinical Order Patterns with Probabilistic Topic Models vs. Conventional Order Sets, *Journal of the American Medical Informatics Association* (2016) (Accepted)
3. Lembke, A., **Chen, J.H.**, Use of Opioid Agonist Therapy for Medicare Patients in 2013, *JAMA Psychiatry* (2016)
4. Hom, J., Richman, I., **Chen, J.H.**, Singh, B., Crump, C., Chi, J. Fulfilling Outpatient Medicine Responsibilities During Internal Medicine Residency: A Quantitative Study of Housestaff Participation with Between Visit Tasks, *BMC Med. Educ*. 2016;16(1):139
5. Ouyang D, **Chen JH**, Krishnan G, Hom J, Witteles R, Chi J. Patient Outcomes When Housestaff Exceed Eighty Hours per Week. *Am. J. Med.* 2016

6. **Chen JH**. The Patient You Least Want to See [A Piece of My Mind]. *JAMA* 2016;315(16):1701
7. **Chen JH**, Goldstein MK, Asch SM, Mackey L, Altman RB. Dynamically Evolving Clinical Practices and Implications For Predicting Medical Decisions. In: *Pacific Symposium of Biocomputing*.Vol 21.; 2016.
8. **Chen JH**, Humphreys K, Shah NH, Lembke A. Distribution of Opioids by Different Types of Medicare Prescribers. *JAMA Intern. Med.* 2016;176(2):259-61
9. Ouyang D, **Chen JH**, Hom J, Chi J. Internal Medicine Resident Computer Usage: An Electronic Audit of an Inpatient Service. *JAMA Intern. Med.* 2016;176(2):252-4
10. **Chen JH**, Podchiyska T, Altman RB. OrderRex: clinical order decision support and outcome predictions by data-mining electronic medical records. *J. Am. Med. Informatics Assoc.* 2016;23(2):339-348
11. Shieh L, Go M, Gessner D, **Chen JH**, Hopkins J, Maggio P. Improving and sustaining a reduction in iatrogenic pneumothorax through a multifaceted quality-improvement approach. *J. Hosp. Med.* 2015;10(9):599-607
12. **Chen JH**, Altman RB. Data-Mining Electronic Medical Records for Clinical Order Recommendations: Wisdom of the Crowd or Tyranny of the Mob? *AMIA Jt. Summits Transl. Sci. Proc. AMIA Summit Transl. Sci.* 2015;2015:435-9
13. Garg T, Lee JY, Evans KH, **Chen J**, Shieh L, Safety P. Development and Evaluation of an Electronic Medical Record–Based Best-Practice Discharge Checklist for Hospital Patients. *Jt. Comm. J. Qual. Patient Saf.* 2015;41(3):126.
14. **Chen JH**, Fang DZ, Tim Goodnough L, Evans KH, Lee Porter M, Shieh L. Why providers transfuse blood products outside recommended guidelines in spite of integrated electronic best practice alerts. *J. Hosp. Med.* 2015;10(1):1-7
15. **Chen JH**, Altman RB. Automated physician order recommendations and outcome predictions by data-mining electronic medical records. AMIA Jt. Summits Transl. Sci. Proc. AMIA Summit Transl. Sci. 2014;2014:206-10.
16. **Chen JH**, Altman RB. Mining for clinical expertise in (undocumented) order sets to power an order suggestion system. *AMIA Jt. Summits Transl. Sci. Proc. AMIA Summit Transl. Sci.* 2013;2013:34-8
17. Kayala MA, Azencott C-A, **Chen JH**, Baldi P. Learning to predict chemical reactions. *J. Chem. Inf. Model.* 2011;51(9):2209-22
18. **Chen JH**, Kayala MA, Baldi P. Reaction Explorer:Towards a Knowledge Map of Organic Chemistry To Support Dynamic Assessment and Personalized Instruction. In: *Enhancing Learning with Online Resources, Social Networking, and Digital Libraries*.Vol 1060. ACS Symposium Series. American Chemical Society; 2010:11-191
19. **Chen JH**, Baldi P. No electron left behind: a rule-based expert system to predict chemical reactions and reaction mechanisms. *J. Chem. Inf. Model.* 2009;49(9):2034-43

20. **Chen JH**, Baldi P. Synthesis Explorer: A Chemical Reaction Tutorial System for Organic Synthesis Design and Mechanism Prediction. *J. Chem. Educ.* 2008;85(12):1699
21. **Chen JH**, Linstead E, Swamidass SJ, Wang D, Baldi P. ChemDB update--full-text search and virtual chemical space. *Bioinformatics* 2007;23(17):2348-51
22. Azencott C-A, Ksikes A, Swamidass SJ, **Chen JH**, Ralaivola L, Baldi P. One- to four-dimensional kernels for virtual screening and the prediction of physical, chemical, and biological properties. *J. Chem. Inf. Model.* 2007;47(3):965-74
23. **Chen J**, Swamidass SJ, Dou Y, Bruand J, Baldi P. ChemDB: A public database of small molecules and related chemoinformatics resources. *Bioinformatics* 2005;21(22):4133-4139
24. Swamidass SJ, **Chen J**, Bruand J, Phung P, Ralaivola L, Baldi P. Kernels for small molecules and the prediction of mutagenicity, toxicity and anti-cancer activity. *Bioinformatics* 2005;21 Suppl 1(2):i359-68
25. Danziger SA, Swamidass SJ, Zeng J, et al. Functional census of mutation sequence spaces: the example of p53 cancer rescue mutants. *IEEE/ACM Trans. Comput. Biol. Bioinform.* 2006;3(2):114-25

Selected Oral Presentations

1. Jonathan H. Chen. “Opioid Prescribing Distribution: What if it’s not just a few bad apples?” **NIH/NIDA Clinical Trials Network**, Invited Webinar, April 2016
2. Jonathan H. Chen, Mary K. Goldstein, Steven M. Asch, Lester Mackey, Russ B. Altman. “Automated Organization of Electronic Health Record Data by Probabilistic Topic Modeling to Inform Clinical Decision Making.” **AMIA Joint Summits on Translational Science**, San Francisco, CA, 2016
3. Jonathan H. Chen, Mary K. Goldstein, Steven M. Asch, Russ B. Altman. “Data-Mining Electronic Health Records for Clinical Decision Support.”
    - OCHIN Research, May 2016
    - Kaiser Permanente Division of Research, March 2016
    - Stanford Department of Medicine Grand Rounds, February 2016
    - Chapman University, Invited Talk, October 2015
    - Stanford Primary Care and Outcomes Research (PCOR), October 2015
    - Veteran Affairs Palo Alto, Center for Innovation to Implementation, April 2015
4. Jonathan H. Chen, Mary K. Goldstein, Steven M. Asch, Russ B. Altman. OrderRex: Data-Mining Clinical Decision Support from Electronic Medical Records, Wisdom of the Crowd or Tyranny of the Mob? **National Library of Medicine Training Conference, NIH**, June 2015
   (Only VA researcher selected for plenary session)
5. Jonathan H. Chen, Russ B. Altman. Data-Mining Electronic Medical Records for Clinical Order Recommendations, Wisdom of the Crowd or Tyranny of the Mob? **AMIA Joint Summits on Translational Science**, San Francisco, CA, 2015
   (Best Student Paper Award, Finalist)
6. Jonathan H. Chen, Russ B. Altman. “Automated Physician Order Recommendations and Outcome Predictions by Data-Mining Electronic

Medical Records." **AMIA Joint Summits on Translational Science**, San Francisco, CA, 2014
(Best Student Paper Award, Winner)

7. Jonathan H. Chen, Russ B. Altman. "Mining for Clinical Expertise in (Undocumented) Order Sets to Power an Order Suggestion System." **AMIA Joint Summits on Translational Science**, San Francisco, CA, March 2013
8. Jonathan H. Chen, Russ B. Altman. "Physician Order Suggestions Powered by Clinical Expertise Mined from (Undocumented) Order Sets." **UC Irvine, Institute for Genomics and Bioinformatics**, Invited Talk, November 2012
9. Jonathan H. Chen, Pierre Baldi. "Reaction Explorer: Organic chemistry online tutorial system for multistep synthesis and mechanism problems adapted to engage students through gaming interfaces." **ACS National Meeting**, Anaheim, CA, Spring 2011.
10. Jonathan H. Chen, Pierre Baldi. "Reaction simulation expert system for synthetic organic chemistry." **ACS National Meeting**, Salt Lake City, UT, Spring 2009.
(Poster Version: Winner of CINF Scholarship for Scientific Excellence)
11. Jonathan H. Chen, Pierre Baldi. "Synthesis Explorer: Organic chemistry tutorial system for multistep synthesis and mechanism problems with personalized assessment and adaptive problem generation." **ACS National Meeting**, Salt Lake City, UT, Spring 2009.
12. Jonathan H. Chen, Pierre Baldi. "Artificial Intelligence in Chemistry: An Expert Computer System for Predicting Organic Chemistry Reactions." **National Library of Medicine Board of Regents Meeting**, February 2009.
(One of only two student speakers invited to present before the board)
13. Jonathan H. Chen, Pierre Baldi. "Reaction mechanism prediction by transformation rules and general principles." **ACS National Meeting**, Philadelphia, PA, Fall 2008.
(Poster Version: Winner of CINF Scholarship for Scientific Excellence)
14. Jonathan H. Chen, Pierre Baldi. "Organic Reaction Expert Systems." **National Library of Medicine Training Conference, NIH**, Summer 2008
15. Jonathan H. Chen, Qian-Nan Hu, Pierre Baldi. "Reaction prediction, classification, and retro-synthesis using a rule-based reaction expert system." **ACS National Meeting**, New Orleans, LA, Spring 2008.
16. Jonathan H. Chen, Pierre Baldi. "Synthesis Explorer: Organic chemistry tutorial system for multistep synthesis design and reaction mechanism prediction." **ACS National Meeting**, New Orleans, LA, Spring 2008.
17. Jonathan H Chen, Peter Phung, Pierre F Baldi. "Synthesis Explorer: Dynamically generated reaction and synthesis problems for organic chemistry education." **ACS National Meeting**, Chicago, IL, Spring 2007.
18. Jonathan H Chen, Erik Linstead, S Joshua Swamidass, Dennis Wang, Yimeng Dou, Pierre Baldi. "ChemDB: A public database of small molecules and related chemoinformatics resources." **ACS National Meeting**, Chicago, IL, Spring 2007.

19. Jonathan H Chen. "Chemical Informatics: Database Searching, Similarity Measures and Property Prediction." **National Library of Medicine Training Conference**, Vanderbilt University, Nashville, TN, Spring 2006.

Professional References

1. Russ Altman, MD, PhD, (650) 725-3394, russ.altman@stanford.edu
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2. Nigam H. Shah, MBBS, PhD, (650) 725-6236, nigam@stanford.edu
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   Prof. Information and Computer Science, University of California, Irvine