

Dennis L. Chao

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EDUCATION

Ph.D. in Computer Science, 2004
The University of New Mexico • Albuquerque, NM

B.S.E. in Computer Science, 1994
Princeton University • Princeton, NJ

RECENT EMPLOYMENT

Staff Scientist, July 2008–present
Fred Hutchinson Cancer Research Center • Seattle, WA

Simulating the transmission of infectious disease in large populations.

Postdoctoral Fellow, 2004–June 2008
Fred Hutchinson Cancer Research Center • Seattle, WA

Epigenetic biomarker discovery and mathematical modeling of tumor growth.

Research Assistant, 1999–2004
Department of Computer Science of the University of New Mexico • Albuquerque, NM

Published original research on immune system modeling, artificial intelligence, and human-computer interaction.

Teaching Assistant, 1998–1999
Department of Computer Science of the University of New Mexico • Albuquerque, NM

Taught beginning and intermediate C++ programming.

Technical Staff, 1994–1998
EPSON Palo Alto Laboratory • Palo Alto, CA

Developed image processing algorithms and end-user software.

PROFESSIONAL ACTIVITIES

Instructor, Summer Institute in Statistics and Modeling in Infectious Diseases, University of Washington, 2009.

Symposium organizer, Biological networks: from measurements to modeling, FHCRC, 2007.

Planning committee, FHCRC Bioethics Colloquium, 2006–2007.

Co-manager, FHCRC Interdisciplinary Club, 2005–2007.

The Pathobiology of Cancer: The Edward A. Smuckler Memorial Workshop, July 2005.

Santa Fe Institute Complex Systems Summer School, June 2000.

Founder, UNM Computer Science Graduate Student Association, 1999.

SELECTED PUBLICATIONS AND PATENTS

Yang Y, Sugimoto JD, Halloran ME, Basta NE, **Chao DL**, Matrajt L, et al. The Transmissibility and Control of Pandemic Influenza A (H1N1) Virus. *Science*. 2009;326(5953):729–733.

Estimated the transmissibility of pandemic influenza A (H1N1) and simulated vaccination strategies to mitigate its effects in the US.

Chao DL, Eck JT, Brash DE, Maley CC, Luebeck EG. Pre-neoplastic lesion growth driven by the death of adjacent normal stem cells. *Proc Natl Acad Sci U S A*. 2008;105(39):15034–15039.

Developed a computer model of pre-cancerous lesion growth and calibrated it using mouse data.

Galipeau PC, **Chao DL**, Li X, Arnaudo JD, Kissel HD, Sanchez CA, Reid BJ. Barrett's esophagus and esophageal adenocarcinoma epigenetic biomarker discovery using Infinium methylation. San Diego, CA: Illumina, Inc.; 2008.

Discovered new biomarkers for identifying different stages of Barrett's esophagus and esophageal cancer using a new array that measures the methylation levels of over 27,000 CpG sites. This is the first published application of the new platform.

Chao DL, Balthrop J, Forrest S. Adaptive Radio: Achieving consensus using negative preferences. In: Schmidt K, Pendergast M, Ackerman M, Mark G, editors. GROUP '05: Proceedings of the 2005 International ACM SIGGROUP Conference on Supporting Group Work. New York: ACM Press; 2005. p. 120–123.

Wrote software to select music to stream in shared environments. The algorithm considered the musical preferences of all occupants in a shared office.

Chao DL, Davenport MP, Forrest S, Perelson AS. The effects of thymic selection on the range of T cell cross-reactivity. *Eur J Immunol*. 2005 Nov 14;35(12):3452–3459.

Developed a mathematical model to predict the impact of positive and negative thymic selection on T cell cross-reactivity. The Java source code is available on the web.

Davenport MP, Ribeiro RM, **Chao DL**, Perelson AS. Predicting the impact of a nonsterilizing vaccine against human immunodeficiency virus. *J Virol*. 2004 Oct;78(20):11340–51.

Estimated the effect of an imperfect HIV vaccine on population-level disease prevalence.

Chao DL, Davenport MP, Forrest S, Perelson AS. Modelling the impact of antigen kinetics on T-cell activation and response. *Immunol Cell Biol*. 2004 Feb;82(1):55–61.

Predicted T cell response kinetics to vaccines and viruses using a computational model. The Java source code is available on the web.

Chao DL, Forrest S. Information Immune Systems. *Genetic Programming and Evolvable Machines*. 2003;4(4):311–331.

Developed a new class of computer algorithms based on immune system principles.

Chao DL. Doom as an interface for process management. In: Jacko JA, Sears A, Beaudouin-Lafon M, Jacob RJK, editors. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems. New York: ACM Press; 2001. p. 152–157.

Adapted a video game to be the interface for a system administration task. The work was featured in Wired magazine and included in a museum exhibit in Austria.

Li C, Pascovici A, Shu J, and **Chao DL**. On-line ink-duty reduction. U.S. Patent 5,799,136. Issued August 25, 1998.

Created a computationally efficient algorithm to reduce the amount of ink used to print images. The algorithm is used by EPSON inkjet printers worldwide.