

CURRICULUM VITAE

Hongye Liu

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Current Position

Teaching Assistant Professor August 2019-present Siebel School of Computing and Data Science, University of Illinois at Urbana-Champaign

Education

Massachusetts Institute of Technology (MIT)

Ph.D., Ocean Engineering (Computer aided design), June 2004

Dissertation: "Feature-based design of solids with local composition control"

Supervisors: Nicholas M. Patrikalakis, Emanuel M. Sachs

Dual M.S., Naval Architecture and Marine Engineering & Mechanical Engineering, June 2000

University of Science and Technology of China (USTC)

B.E. Precision Machinery and Instrumentation, June 1993

Minor in Electrical Engineering

Teaching Experience

Aug 2019-present Teaching "Probability and statistics for computer science" (CS361) at the University of Illinois at Urbana Champaign

Feb 2016-May 2016 Mentoring a first year Harvard Public Health Biostatistics student intern

July 2015 Guest Lecturing "Machine Learning" at Northeastern Univ. Math Dept.

April. 2015-June 2015 Mentoring an exchange college Math student of Zhejiang Univ., Harvard Medical School (HMS)

Sept.2013-June 2015 Training and instruction on large multi-dimensional single cell data analysis methods for students and postDocs. HMS

Spring 2000 Teaching assistant, Computational Geometry, MIT

Research Interests

Educational research to support undergraduate students with disabilities or special needs, Universal Design for Learning, Accessibility Research, Mentoring undergraduate research, machine learning methods, algorithm development for big data analysis, data visualization, interactive data exploration, integrative bio-medical data analysis, biostatistics, computational biology, single cell dynamic biological data analysis, high throughput genomic profiling data analysis.

Research Experience

Aug. 2019 – present	Educational Research on Universal Design for Learning and Course Accessibility to support more students especially students with disabilities or students with other unmet needs <u>Research scope:</u> Survey and analysis of the perspectives of the students with disabilities based on the universal design of learning principle; implementation of best practices using technology and learning management system to support inclusive classroom.
July 2015 – April 2019	Research/Data Scientist, DFCI <u>Research scope:</u> Data analysis of CyTOF* data and flow cytometry data; development of machine learning and visualization tools for high dimensional single cell data; consultation for Longwood CyTOF users; collaboration with DFCI's Belfer Center's cancer immune-profiling research team
Sept. 2013- June 2015	Research Faculty, Laboratory of Systems Pharmacology, Harvard Medical School (HMS), Data Scientist, Harvard Longwood CyTOF Consortium. <u>Research scope:</u> Data analysis of CyTOF data, development of machine learning and visualization tools for high dimensional single cell data; consultation for Harvard Longwood area CyTOF users;
Nov. 2008-Aug. 2013	Instructor, Informatics program, Boston Children's Hospital, Harvard-MIT Health Science & Technology <u>Research scope:</u> microRNA data analysis; mRNA data analysis; comparative genomic modeling of cancer development; collaboration on Pediatric brain tumor studies.
Feb. 2011-Aug. 2013	Statistician, Clinical Research Center, Boston Children's Hospital <u>Research scope:</u> Biostatistics analyses of clinical research data
2004-2008	Research fellow, Informatics program, Boston Children's Hospital, <u>Research projects:</u> Lung cancer and brain tumors studies in comparison with corresponding developing tissues.
1997-2004	Research assistant, Design Laboratory & Three-Dimensional Printing Laboratory, MIT, MA <u>Research project:</u> Computer aided solid modeling method, algorithm and software development for 3-D printing
1993-1997	Engineer, National Synchrotron Radiation Laboratory, University of Science and Technology of China, Hefei, China <u>Work scope:</u> Operation of the synchrotron radiation accelerator; organization of an international workshop on beam instabilities in storage rings.

* CyTOF stands for Mass Cytometry

Book Chapter

Springer Handbook of Bio-/Neuroinformatics 2014, pp 43-55 Information Processing at the Genomics Level. Kho A and **Liu H.**

Selected Publications

Tao, A., Ding, X., Gelli, A., Zhang, Y. Y., Hogg, J., Sundaram N., Ni, D., Tamilarasan, S., Shao, V., Vogiatzis, C., Robles-Grandas, P., Amos, J., Angrave, L., **Liu, H.** “Evaluating the perceived outcomes and understanding the needs of engineering and computing students in connection to the use of multi-modal mathematical lecture content” ASEE Conference 2026.

Gelli, A., Tao, A., Zhang, Y. Y., Sundaram N., Tamilarasan, S., Hogg, J., Shao, V., Vogiatzis, C., Robles-Grandas, P., Angrave, L., **Liu, H.** “Identifying, categorizing, and evaluating the taxonomy of STEM content and the obstacles in converting handwritten lecture materials of engineering courses for improved accessibility” ASEE Conference 2026.

Ding, X., Zhao, D., Tao, A., Gopannagari, M., Robles-Grandas, P., Shao, V., Vogiatzis, C., Fredricksen, A., Amos, J., Angrave, L., **Liu, H.** “*Understanding the needs of students to make Mathematics and other STEM Contents more accessible in college Engineering courses*” ASEE Conference 2025.

Asanaka, L., Zhao, D., Gopannagari, M., Tamilarasan, S., Tao, A., Zhang, N. Sletten, G., Solarman, A., Ding, X., Robles-Grandas, P., Shao, V., Vogiatzis, C., Angrave, L., **Liu, H.** “*Improving the Accessibility of Mathematical and other STEM Content in Engineering courses through Machine Learning Models*” ASEE Conference 2025.

Robles-Granda, P., **Liu, H.**, Anwar C., Narang, S., Dalpiaz, D., Angrave, L. “*Beyond Descriptive Statistics: Analysis of Time Series of Student Interactions in Engineering Courses Through the Lens of Modern Mathematical Methods*” ASEE Conference 2025.

Ding X., Gopannagari M., Sun K., Tao A., Zhao D., Varadhan S., Hardy B., Dalpiaz D., Vogiatzis C., Angrave L., and **Liu H.** Evaluation of LLMs and Other Machine Learning Methods in the Analysis of Qualitative Survey Responses for Accessible Engineering Education Research. Proceedings of the ASEE Conference 2024.

Zhao D., Gopannagari M., Ding X., Tao A., Varadhan S., Vogiatzis C., Dalpiaz D., Huang Y., Amos J., Dignan R., Hardy B., Angrave L. and **Liu H.** (2024) Accessibility Nuggets, Video Vignettes, and other Instructor Development approaches to foster UDL adoption and Inclusive Engineering Education. Proceedings of the ASEE Conference 2024.

Ding X., Sun K., Xiao Z., Varadhan S., Li J., Gersich N., Agarwal A., Gopannagari M., Vogiatzis C., Dalpiaz D., Amos J., Angrave L., **Liu, H.** (2023) Evaluating the low-stakes assessment performance, student perceived accessibility, belongingness, and self-efficacy in connection to the use of digital notes in engineering and computing courses. Proceedings of the ASEE Conference 2023

Varadhan S., Ding X., Zhao D., Agarwal A., Dalpiaz D., Vogiatzis C., Huang Y., Angrave L., **Liu H.** Opportunities and Barriers to UDL-based Course Designs for Inclusive Learning in Undergraduate Engineering and other STEM courses. Proceedings of the ASEE Conference 2023.

Liu H., Angrave L, Amos J, Dalpiaz D, Vogiatzis C, Xiao ZY, Varadhan S, Louie J (2022) A Digital Book-Based Pedagogy to Improve Course Content Accessibility for Students with and without Disabilities in Engineering and other STEM courses (WIP), Proceedings of the ASEE Conference 2022.

Liu H., Moparathi D, Dalpiaz D, Amos JR, Angrave L, Vogiatzis C, Reck R, Varadhan S (2022) Understanding the needs of students with and without disabilities for inclusive UDL-based design of Engineering courses through learning management systems. Proceedings of the ASEE Conference, Minneapolis MN, June 2022.

Amos JR, Zhang Z, Angrave L, **Liu H.**, Shen Y (2021) A UDL-based large-scale study on the needs of students with disabilities in engineering courses. Proceedings of the ASEE Conference, Long Beach CA, July 2021.

Vawani K, Zhang Z, Angrave L, **Liu H.**, Amos JR (2021) Qualitative Analysis of college students' perception of multiple representations and modalities in courses. Proceedings of the IL-IN ASEE, April 16, 2021.

Angrave L., Jensen K., Zhang Z., Mahipal C., Mussulman M., Schmitz C., Baird R., Liu H., Sui R., Wu M., Kooper R. 2020. "Improving Student Accessibility, Equity, Course Performance, and Lab Skills: How Introduction of ClassTranscribe Is Changing Engineering Education at the University of Illinois." In Proceedings of ASEE Annual Virtual Conference 2020. ASEE.

Deng J, Wang ES, Jenkins RW, Li S, Dries R, Yates K, Chhabra S, Huang W, **Liu H.**, Aref AR, Ivanova E, Paweletz CP, Bowden M, Zhou CW, Herter-Spie GS, Sorrentino JA, Bisi JE, Lizotte PH, Merlino AA, Quinn MM, Bufe LE, Yang A, Zhang Y, Zhang H, Gao P, Chen T, Cavanaugh ME, Rode AJ, Haines E, Roberts PJ, Strum JC, Richards WG, Lorch JH, Parangi S, Gunda V, Boland GM, Bueno R, Palakurthi S, Freeman GJ, Ritz J, Haining WN, Sharpless NE, Arthanari H, Shapiro GI, Barbie DA, Gray NS, Wong KK. CDK4/6 Inhibition Augments Anti-Tumor Immunity by Enhancing T Cell Activation. *Cancer Discov.* 2017 Nov 3. pii: CD-17-0915. doi: 10.1158/2159-8290.CD-17-0915. [Epub ahead of print]

Jenkins RW, Aref AR, Lizotte PH, Ivanova E, Stinson S, Zhou CW, Bowden M, Deng J, **Liu H.**, Miao D, He MX, Walker W, Zhang G, Tian T, Cheng C, Wei Z, Palakurthi S, Bittinger M, Vitzthum H, Kim JW, Merlino A, Quinn M, Venkataramani C, Kaplan JA, Portell A, Gokhale PC, Phillips B, Smart A, Rotem A, Jones RE, Keogh L, Anguiano M, Stapleton L, Jia Z, Barzily-Rokni M, Cañadas I, Thai TC, Hammond MR, Vlahos R, Wang ES, Zhang H, Li S, Hanna GJ, Huang W, Hoang MP, Piris A, Eliane JP, Stemmer-Rachamimov AO, Cameron L, Su MJ, Shah P, Izar B, Thakuria M, LeBoeuf NR, Rabinowits G, Gunda V, Parangi S, Cleary JM, Miller BC, Kitajima S, Thummalapalli R, Miao B, Barbie TU, Sivathanu V, Wong J, Richards WG, Bueno R, Yoon CH, Miret J, Herlyn M, Garraway LA, Van Allen EM, Freeman GJ, Kirschmeier PT, Lorch

JH, Ott PA, Hodi FS, Flaherty KT, Kamm RD, Boland GM, Wong KK, Dornan D, Paweletz CP, Barbie DA. Ex Vivo Profiling of PD-1 Blockade Using Organotypic Tumor Spheroids. *Cancer Discov.* 2017 Nov 3. pii: CD-17-0833. doi: 10.1158/2159-8290.CD-17-0833. [Epub ahead of print]

Hanna GJ, **Liu H**, Jones RE, Bacay AF, Lizotte PH, Ivanova EV, Bittinger MA, Cavanaugh ME, Rode AJ, Schoenfeld JD, Chau NG, Haddad RI, Lorch JH, Wong KK, Uppaluri R, Hammerman PS. Defining an inflamed tumor immunophenotype in recurrent, metastatic squamous cell carcinoma of the head and neck. *Oral Oncol.* 2017 Apr;67:61-69. doi: 10.1016/j.oraloncology.2017.02.005. Epub 2017 Feb 14.

Awad MM, Jones RE, **Liu H**, Lizotte PH, Ivanova EV, Kulkarni M, Herter-Sprie GS, Liao X, Santos AA, Bittinger MA, Keogh L, Koyama S, Almonte C, English JM, Barlow J, Richards WG, Barbie DA, Bass AJ, Rodig SJ, Hodi FS, Wucherpennig KW, Jänne PA, Sholl LM, Hammerman PS, Wong KK, Bueno R. Cytotoxic T Cells in PD-L1-Positive Malignant Pleural Mesotheliomas Are Counterbalanced by Distinct Immunosuppressive Factors. *Cancer Immunol Res.* 2016 Dec;4(12):1038-1048. Epub 2016 Nov 14.

Hirakawa M, Matos T, **Liu H**, Koreth J, Kim HT, Paul NE, Murase K, Whangbo J, Alho AC, Nikiforow S, Cutler C, Ho VT, Armand P, Alyea EP, Antin JH, Blazar BR, Lacerda JF, Soiffer RJ, Ritz J. Low-dose IL-2 selectively activates subsets of CD4+ Tregs and NK cells. *JCI Insight.* 2016 Nov. 3; 1(18):e89278

Lizotte PH, Ivanova EV, Awad MM, Jones RE, Keogh L, **Liu H**, Dries R, Almonte C, Herter-Sprie GS, Santos A, Feeney NB, Paweletz CP, Kulkarni MM, Bass AJ, Rustgi AK, Yuan GC, Kufe DW, Jänne PA, Hammerman PS, Sholl LM, Hodi FS, Richards WG, Bueno R, English JM, Bittinger MA, Wong KK. Multiparametric profiling of non-small-cell lung cancers reveals distinct immunophenotypes. *JCI Insight.* 2016 Sep. 8; 1(14):e89014

Lizotte PH, Jones RE, Keogh L, Ivanova E, **Liu H**, Awad MM, Hammerman PS, Gill RR, Richards WG, Barbie DA, Bass AJ, Bueno R, English JM, Bittinger M, Wong KK. Fine needle aspirate flow cytometric phenotyping characterizes immunosuppressive nature of the mesothelioma microenvironment. *Sci. Rep.* 2016 Aug 19; 6:31745.

Rosen R, Amirault J, **Liu H**, Mitchell P, Hu L, Khatwa U, Onderdonk A. Changes in gastric and lung microflora with acid suppression: acid suppression and bacterial growth. *JAMA Pediatr.* 2014 Oct; 168(10):932-7

Fried AJ, Altrich ML, **Liu H**, Halsey JF, Bonilla FA. Correlation of Pneumococcal Antibody Concentration and Avidity with Patient Clinical and Immunologic Characteristics. *J Clin Immunol.* 2013 Feb 3.

Meijer DH, Kane MF, Mehta S, **Liu H**, Harrington E, Taylor CM, Stiles CD, Rowitch DH. Separated at birth? The functional and molecular divergence of OLIG1 and OLIG2. *Nat Rev Neurosci.* 2012 Dec;13(12):819-31. doi: 10.1038/nrn3386. Review.

Liu H and Kohane IS. Tissue and process specific microRNA-mRNA co-expression in mammalian development and malignancy. *PLoS ONE* 4(5): e5436. Epub 2009 May 5.

Ligon KL, Huillard E, Mehta S, Kesari S, **Liu H**, Alberta J A, Bachoo RM, Kane M, Louis DN, DePinho RA, Anderson DJ, Stiles CD, and Rowitch DH. Olig2-Regulated Lineage-Restricted Pathway Controls Replication Competence in Neural Stem Cells and Malignant Glioma. *Neuron* 53, 503-517, February 15, 2007.

Liu H, Kho AT, Kohane IS, and Sun Y. Predicting survival within the lung cancer histopathological hierarchy using a multi-scale genomic model of development. *PLoS Med.* 3(7):e232, 2006.

Liu H, Maekawa T, Patrikalakis NM, Sachs EM, and Cho W. Methods for Feature-Based Design of Heterogeneous Solids. *Computer Aided Design.* 36(12), 1141-1159, 2004.

Jackson TR, **Liu H**, Patrikalakis NM, Sachs EM and Cima MJ. Modeling and Designing Functionally Graded Material Components for Fabrication with Local Composition Control. *Materials and Design.* 20(2-3), 63-75, 1999.

Journal/Conference review or editorship:

May 2023-present annual conference	ad hoc reviewer	American Society of Engineering Education (ASEE)
April 2013	ad hoc reviewer	Genomics
June 2010	ad hoc reviewer	Lung Cancer: Targets and Therapy
July 2008-present	ad hoc reviewer	Mathematics and Computers in Simulation
May 2004-present	ad hoc reviewer	Computer Aided Design
Summer 1994	co-editor	Proceedings of the workshop on Beam Instabilities in Storage Rings", ISBN 7-312-00676-0/O.161

Conferences

- 1) Speaker in ASEE 2025 annual conference on the topics of "Understanding the needs of students to make Mathematics and other STEM Contents more accessible in college Engineering courses" and "Improving Accessibility of STEM Content in Engineering courses with ML Models", June 2025.
- 2) Speaker in 27th Accessing Higher Ground Conference on the topic of "Opportunities and barriers in implementing UDL for accessibility - data from both students and faculty's perspectives", Nov. 2023.
- 3) Speaker in ASEE 2023 annual conference on the topic of "Evaluating the Low-Stakes Assessment Performance: Student-Perceived Accessibility, Belongingness, and Self-Efficacy in Connection to the Use of Digital Notes in Engineering and Computing Courses", June 2023.

- 4) Speaker in 26th Accessing Higher Ground Conference on the topic of “Understanding the needs of students with disabilities based on Universal Design of Learning and some implementations”, Nov. 2022.
- 5) Speaker in ASEE 2022 annual conference on the topic of “A Digital Book-Based Pedagogy to Improve Course Content Accessibility for Students with and without Disabilities in Engineering and other STEM courses”.
- 6) Speaker in ASEE 2021 annual conference on the topic of “A UDL-based large-scale study on the needs of students with disabilities in engineering courses”.
- 7) Speaker in the Illinois CS Summer Teaching workshop 2021 on the topic of “Understanding of the needs of students with disabilities-what does data in two semesters of covid19 tell us?”
- 8) Organized and hosted a panel discussion in the Tapia 2021 annual conference on the topic of “Understanding of the needs of students with disabilities based on Universal Design of Learning principle”

Software packages

- 1) Solidworks API implementation of Local Composition Control Feature based Solid modeler (in C++).
- 2) R package of Mass Cytometry Data or Flow Cytometry Data navigator and analysis tool (in preparation)

Awards

3rd Best Paper Award & 2nd Best Diversity, Equity, and Inclusion Paper Award in the ASEE 21 annual conference, NEE section. Paper title: A UDL-based large-scale study on the needs of students with disabilities in engineering courses.

Best DEI Paper Award in ASEE 22 annual conference, NEE section. Paper title: A Digital Book-Based Pedagogy to Improve Course Content Accessibility for Students with and without Disabilities in Engineering and other STEM courses (WIP).

2nd Best Diversity, Equity, and Inclusion Paper Award in the ASEE 21 annual conference, NEE section. Paper title: “Beyond Descriptive Statistics: Analysis of Time Series of Student Interactions in Engineering Courses Through the Lens of Modern Mathematical Methods”.

Current and past funded projects:

PI, GIANT 2025-26 project titled “**Developing tools to make Mathematics and other STEM contents move accessible in college engineering courses**”. Phase II.

PI, GIANT 2024-25 project titled “**Developing tools to make Mathematics and other STEM contents move accessible in college engineering courses**”

PI, SIIP 2021-24 implementation project titled “**UDL based best practices including utilizing Canvas for the needs of students with disability**”

PI, GIANT 2021-2023 project titled “**Applying a Theoretical Understanding of Text-Based Learning Modalities To Develop New Course Modalities That Meet the Needs of Student With Disabilities**”

PI, Microsoft funded project titled “**Universal Design for Learning in STEM**” as part of the Digital Accessibility 2022 @Illinois.

Diversity Activities/Services

Member, University of Illinois Urbana-Champaign Senate 2024-27

Member, Senate Committee on Faculty and Academic Staff Benefits, UIUC 2026-2027

Member, Anti-Racism Task force at Grainger College of Engineering, summer 2020.

Member, Ombudperson initial appointment committee, 2020.

Member, IDEA institute, since March 2021

Member, accessibility team of the Canvas transition of the campus 2021.

Presenter, U of I summer teaching academy 2021.

Consultant, the first Sustainability Competition for Undergraduates 2021.

Member, BPC committee of the CS department.

Presenter, AE3 Collins Scholar Program

Presenter, AE3 tPro2 program

Mentor, Carle Illinois DSP Mentor Project

Member, Student Award Committee since 2019 -now

Websites:

- 1) Personal professional page in CS: <https://cs.illinois.edu/about/people/faculty/hl314>
- 2) Research group as PI: <https://publish.illinois.edu/udl-accessibility-group/>
- 3) Personal profile page: <https://publish.illinois.edu/hongyeliu/>