

AI & MACHINE LEARNING PUBLICATIONS INVENTORY

Conferences, published articles, seminars/webinars and whitepapers featuring IQVIA experts

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2023

Peer Reviewed Articles

1. Rigg J, Doyle O, McDonogh N, Leavitt N, Ali R, Son A, Kreter B. **Finding undiagnosed patients with hepatitis C virus: an application of machine learning to US ambulatory electronic medical records.** *BMJ Health & Care Informatics.* 2023 Jan 1;30(1): e100651.
2. Wakutsu N, Hirose E, Yonemoto N, Demiya S. **Assessing Definitions, and Incentives Adopted for Innovation for Pharmaceutical Products in Five High-Income Countries: A Systematic Literature Review.** *Pharmaceut Med.* 2023 Jan 17:1–18
3. Luo H, Lau WCY, Chai Y, Torre CO, Howard R, Liu KY, et al. **Rates of Antipsychotic Drug Prescribing Among People Living with Dementia During the COVID-19 Pandemic.** *JAMA Psychiatry.* 2023 Jan 25: e224448. doi: 10.1001/jamapsychiatry.2022.4448. Epub ahead of print. PMID: 36696128; PMCID: PMC9878427.
4. Philippe Rocca-Serra, Wei Gu, Vassilios Ioannidis, Tooba abbassi-Daloi, Salvador, et al.; **The FAIR Cookbook - the essential resource for and by FAIR doers.** *Sci Data* **10**, 292 (2023). <https://doi.org/10.1038/s41597-023-02166-3>
5. Gao, J., Heintz, J., Mack, C., Glass, L., Cross, A., & Sun, J. (2023). **Evidence-driven spatiotemporal COVID-19 hospitalization prediction with Ising dynamics.** *Nature communications*, 14(1), 3093. <https://doi.org/10.1038/s41467-023-38756-3>
6. Serghiou, S., & Rough, K. (2023). **Deep Learning for Epidemiologists: An introduction to neural networks.** *American journal of epidemiology*, kwad107. Advance online publication. <https://doi.org/10.1093/aje/kwad107>
7. Luo H, Lau WCY, Chai Y, Torre CO, Howard R, Liu KY, et al. **Rates of Antipsychotic Drug Prescribing Among People Living with Dementia During the COVID-19 Pandemic.** *AMA Psychiatry.* 2023 Mar 1;80(3):211-219. <https://pubmed.ncbi.nlm.nih.gov/36696128/>

Conferences

PMSA

8. Ruoxin Li, Karl Svensson, Lihua Tan, Rowan D’Annibale, Paige Desmarais, **Finding Hidden Referrers for Infusion Products by Leveraging Machine Learning**, Podium Presentation at PMSA 2023 Annual Conference
9. Ruoxin Li, Yujie Sun, Yunlong Wang, **Identifying Lookalike Healthcare Providers by Looking – Using Computer Vision Techniques to Find Next Best Targets**, Poster Presentation at PMSA 2023 Annual Conference

10. Tong Wu, Mateusz Buda, Mukesh Mithrakumar, Yunlong Wang, Srikanth Sankaran Iyer, Tanveer Ahmed Nasir, **"Leveraging Language Model for Next Best Action in Promotion Campaigns to Augment HCP Engagement"**, 2023 PMSA Annual Conference, May 2023
11. Mack C, Sun J, Wang Z, Gao C, Rough K, Glass L. **Machine Learning and Artificial Intelligence for Clinical Trial Optimization: A Review of Opportunities to Leverage Real World Data [abstract]**. In: ISPOR 2023; 2023 May 7-10; Boston, MA, USA.
12. Shankar R, Poole L, Halmos T, Dn V, Sen S, Rough K, Mack C. **Using AI to Support Evidence & Market Access Strategy Development [presentation]**. In: ISPOR 2023; 2023 May 7-10; Boston, MA, USA.
13. Wenbo Zhang, Tong Wu, Yunlong Wang, Yong Cai, and Hengrui Cai, **"Towards Trustworthy Explanation: On Causal Rationalization"**, 40th International Conference on Machine Learning (ICML), 2023

Articles (continued)

14. Hui Jin, Yue Wang, Siyi Yu, Chuchu Liu, Daozhou Yao, Suge Wang, **COVID-19 Tracking for VOC, drug, and vaccine**
15. Hui Jin, Yue Wang, Tu Tu, Yubo He, Bingzhen Wu, et al. **ChatGPT application discussion in healthcare**

2022

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16. Fu, Tianfan, Kexin Huang, Cao Xiao, Lucas M. Glass, and Jimeng Sun. **HINT: Hierarchical interaction network for clinical-trial-outcome predictions**. *Patterns* 3, no. 4 (2022): 100445.
17. Ambrosy AP, Parikh RV, Sung SH, Tan TC, Narayanan A, et al. **Analysis of Worsening Heart Failure Events in an Integrated Health Care System**. *J Am Coll Cardiol*. 2022 Jul 12;80(2):111-122
18. Bamford, S., Lyons, S., Arbuckle, L., & Chetelat, P. **Sharing Anonymized and Functionally Effective (SAFE) Data Standard for Safely Sharing Rich Clinical Trial Data**. *Applied Clinical Trials* (2022).
19. Rishi Parikh, Thida Tan, Ajit Mahapatra, Weijia Wang, Robert Perkins, Alan Go. **Population-Based Identification of Biopsy Proven IGA Nephropathy using Natural Language Processing: The Knight Study**. *Nephrology Dialysis Transplantation*, Volume 37, Issue Supplement_3, May 2022, gfac105.001, <https://doi.org/10.1093/ndt/gfac105.001>

20. Hom J, Nikowitz J, Ottesen R, Niland JC. **Facilitating clinical research through automation: Combining optical character recognition with natural language processing.** Clin Trials. 2022 May 24;17407745221093621. doi: 10.1177/17407745221093621. Online ahead of print. PMID: 35608136
21. Soora Wi, Patricia E. Goldhoff, Laurie A. Fuller, Kiranjit Grewal, Nicolas Wentzensen, Megan A. Clarke, iThomas S. Lorey; **Using Natural Language Processing to Improve Discrete Data Capture From Interpretive Cervical Biopsy Diagnoses at a Large Health Care Organization.** Arch Pathol Lab Med 2022; doi: <https://doi.org/10.5858/arpa.2021-0410-OA>
22. Solomon BJ, Loong HH, Summers Y, Thomas ZM, French P, et al. **Correlation between treatment effects on response rate and progression-free survival and overall survival in trials of targeted therapies in molecularly enriched populations.** ESMO Open. 2022 Feb 15;7(2):100398. doi: 10.1016/j.esmoop.2022.100398. Epub ahead of print. PMID: 35183043.
23. A Witzmann, E Batanova, L Queiros, S Abogunrin. **Ontology-Based Text Mining in Scientific Literature. Value in Health.** Volume 25, Issue 1, Supplement, S202
24. King, L. M., Kusnetsov, M., Filippoupolitis, A., Arik, D., Bartoces, et al. (2022) **Using machine learning to examine drivers of inappropriate outpatient antibiotic prescribing in acute respiratory illnesses,** Infection Control & Hospital Epidemiology. Cambridge University Press, pp. 1–5. doi: 10.1017/ice.2021.476.
25. Hu, Lining, Yuhang Zhang, Yang Zhao, Tong Wu, and Yongfu Li. **"Micro-YOLO+: Searching Optimal Methods for Compressing Object Detection Model Based on Speed, Size, Cost, and Accuracy."** SN Computer Science 3, no. 5 (2022): 1-8.
26. Jie Hu, Vishwaraj Doshi and Do Young Eun, **"Efficiency Ordering of Stochastic Gradient Descent"**. Advances in Neural Information Processing 35, NeurIPS, 2022
27. Lazzarini, N., Filippoupolitis, A., Manzione, P. and Eleftherohorinou, H., 2022. **A machine learning model on Real World Data for predicting progression to acute respiratory distress syndrome (ARDS) among COVID-19 patients.** PLoS One, 17(7), p.e0271227. <https://doi.org/10.1371/journal.pone.0271227>
28. Schöler D., Kostev K., Peters M., Zamfir C., Wolk A., Roderburg C., Loosen S.H., **Machine learning can predict the probability of biologic therapy in patients with inflammatory bowel disease,** Journal of Clinical Medicine.
29. Junyi Gao, Cao Xiao, Lucas M. Glass, Jimeng Sun. **PopNet: Real-Time Population-Level Disease Prediction with Data Latency.** arXiv:2202.03415 (2022).
30. Chaoqi Yang, Cheng Qian, Jimeng Sun. **GOCPT: Generalized Online Canonical Polyadic Tensor Factorization and Completion.** arXiv:2205.03749 (2022).
31. Zifeng Wang, Chufan Gao, Lucas M. Glass, Jimeng Sun. **Artificial Intelligence for In Silico Clinical Trials: A Review.** arXiv:2209.09023 (2022).

32. Zhenbang Wu, Huaxiu Yao, Zhe Su, David M Liebovitz, Lucas M Glass, et al. **Knowledge-Driven New Drug Recommendation.** arXiv:2210.05572 (2022).
33. Gray SW, Ottesen RA, Currey M, Cristea M, Nikowitz J, et al. **Leveraging an Informatics Approach to Identify an Unmet Clinical Need for BRCA1/2 Testing Among Patients With Ovarian Cancer.** JCO Clin Cancer Inform. 2022 Sep;6:e2200034.
34. Christina Scott, Andrew Dodson, Muriel Saulnier, Kevin Snyder, Rebecca Racz, **Analysis of secondary pharmacology assays received by the US Food and Drug Administration,** J Pharmacol Toxicol Methods. 2022 Aug 1; <https://doi.org/10.1016/j.vascn.2022.107205>.
35. Catherine E. Barrett, PhD; Alain K. Koyama, ScD; Pablo Alvarez, MPH; Wilson Chow; Elizabeth A. Lundeen, PhD; et al. **Risk for Newly Diagnosed Diabetes >30 Days After SARS-CoV-2 Infection Among Persons Aged <18 years - United States, March 1, 2020–June 28, 2021, January 2022 - Morbidity and Mortality Weekly Report (MMWR),** <https://www.cdc.gov/mmwr/volumes/71/wr/mm7102e2.htm>
36. Cheheltani R, King N, Lee S, North B, Kovarik D, Evans-Molina C, Leavitt N, Dutta S. **Predicting misdiagnosed adult-onset type 1 diabetes using machine learning.** Diabetes Research and Clinical Practice. 2022 Sep 1;191:110029.
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39. Alsheikh AJ, Wollenhaupt S, King EA, Reeb J, Ghosh S, Stolzenburg LR, Tamim S, Lazar J, Davis JW, Jacob HJ. **The landscape of GWAS validation; systematic review identifying 309 validated non-coding variants across 130 human diseases.** BMC Med Genomics. 2022 Apr 1;15(1):74.
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41. Zaritsky E, Le A, Tucker LY, Ojo A, Weintraub MR, Raine-Bennett T. **Minimally invasive myomectomy: practice trends and differences between Black and non-Black women within a large integrated healthcare system.** Am J Obstet Gynecol. 2022 Jun;226(6):826.e1-826.e11.
42. Jamieson MJ, Byon W, Dettloff RW, Crawford M, Gargalovic PS, et al. **Apixaban Use in Obese Patients: A Review of the Pharmacokinetic, Interventional, and Observational Study Data.** Am J Cardiovasc Drugs. 2022 Nov;22(6):615-631.
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46. **JCO Clin Cancer Inform.** 2022 Sep;6:e2200034.
47. "Christina Scott, Andrew Dodson, Muriel Saulnier, Kevin Snyder, Rebecca Racz, **Analysis of secondary pharmacology assays received by the US Food and Drug Administration,** *J Pharmacol Toxicol Methods.* 2022 Aug 1; <https://doi.org/10.1016/j.vascn.2022.107205>."
48. **"Analysis of Worsening Heart Failure Events in an Integrated Health Care System.** Ambrosy AP, Parikh RV, Sung SH, Tan TC, Narayanan A, et al. 2022 Jul 12;80(2):111-122"
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50. **"Population-Based Identification of Biopsy Proven IGA Nephropathy using Natural Language Processing: The Knight Study** Rishi Parikh, Thida Tan, Ajit Mahapatra, Weijia Wang, Robert Perkins, Alan Go *Nephrology Dialysis Transplantation, Volume 37, Issue Supplement_3, May 2022, gfac105.001, <https://doi.org/10.1093/ndt/gfac105.001>"*
51. Soora Wi, Patricia E. Goldhoff, Laurie A. Fuller, Kiranjit Grewal, Nicolas Wentzensen, Megan A. Clarke, Thomas S. Lorey; **Using Natural Language Processing to Improve Discrete Data Capture From Interpretive Cervical Biopsy Diagnoses at a Large Health Care Organization.** *Arch Pathol Lab Med* 2022; doi: <https://doi.org/10.5858/arpa.2021-0410-OA>
52. Solomon BJ, Loong HH, Summers Y, Thomas ZM, French P, Lin BK, Sashegyi A, Wolf J, Yang JC, Drilon A. **Correlation between treatment effects on response rate and progression-free survival and overall survival in trials of targeted therapies in molecularly enriched populations.** *ESMO Open.* 2022 Feb 15;7(2):100398. doi: 10.1016/j.esmoop.2022.100398. Epub ahead of print. PMID: 35183043.
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54. Li X, Burn E, Duarte-Salles T, Yin C, Reich C, Delmestri A et al. **Comparative risk of thrombosis with thrombocytopenia syndrome or thromboembolic events associated with different covid-19 vaccines: international network cohort study from five European countries and the US** *BMJ* 2022; 379 :e071594 doi:10.1136/bmj-2022-071594
55. Lau WCY, Torre CO, Man KKC, Stewart HM, Seager S, Van Zandt M, et al. **Comparative Effectiveness and Safety Between Apixaban, Dabigatran, Edoxaban, and Rivaroxaban Among Patients With Atrial Fibrillation : A Multinational Population-Based Cohort Study.** *Ann Intern Med.* 2022

Nov;175(11):1515-1524. doi: 10.7326/M22-0511. Epub 2022 Nov 1. Erratum in: Ann Intern Med. 2022 Dec 6;: PMID: 36315950.

Conferences

AAAI

56. Lin, Zhen, Lucas Glass, M. Brandon Westover, Cao Xiao, and Jimeng Sun. **SCRIB: set-classifier with class-specific risk bounds for blackbox models**. Thirty-Sixth AAAI Conference on Artificial Intelligence, vol. 36, no. 7, pp. 7497-7505, 2022.

ACM

57. Gao, Junyi, Cao Xiao, Lucas M. Glass, and Jimeng Sun. **PopNet: Real-Time Population-Level Disease Prediction with Data Latency**. In Proceedings of the ACM Web Conference 2022, pp. 2552-2562. 2022.

ISPOR

58. Tu T, Chen L, Wang Y, Jin H, He W. **Multi-Task Learning in Click-through-Probability (Multi-CTP) Prediction for Real-World Digital Content Recommendation**. ISPOR 2022, Virtual conference, May 2022
59. Rebollo P, Wolk A, Luczko M, Tang JP, **Development of a Machine Learning predictive model for stroke among patients with non-valvular atrial fibrillation receiving oral anticoagulant treatment**, ISPOR 2022.
60. Rathore A, Anastassopoulou A, Parhofer KG, Becker C, Zamfir C, Calver H, Dave R, **Machine Learning for Clustering Dyslipidemia Patients with Statin Intolerance in Germany**, ISPOR 2022.
61. Yuri Sakai, Takanori Ishii, Seok-Won Kim, Satoshi Murayama, Asahi, Lee Hirofumi, Shi Wen, Shujiro Takeno **Prevalence of depression in Japan and the US Populations before and during the covid 19 pandemic: A retrospective observational study using real world data** November 2022 – ISPOR Europe <https://www.ispor.org/heor-resources/presentations-database/presentation/euro2022-3564/119994>
62. Cook J, Mattern F, Schnauffer D, Wiest T, Gallinger P. **Implementation and application of the physician information system (arztinformationssystem, ais) in Germany**, November 2022 – ISPOR Europe <https://www.ispor.org/heor-resources/presentations-database/presentation/euro2022-3565/119130>
63. Tu T, Chen L, Wang Y, Jin H, He W. **Multi-Task Learning in Click-through-Probability (Multi-CTP) Prediction for Real-World Digital Content Recommendation**. ISPOR 2022, Virtual conference, May 2022
64. Wenli Sun, Yong Cai, Yanping liu, **Comparisons of Encoding Techniques for Categorical Features in Linear Regression Models**, 2022 ISPOR Annual Conference, May 2022.

PMSA

65. John Eichert, D. Bruce West, Guanhao Wei, Li Zhou, Lynn Lu. **AIML Powered Thought Leader Networks for Identifying HCP Relationships and Boosting Market Performance**. 2022 PMSA Annual Conference, May 2022
66. Guanhao Wei, Marc Romano, Li Zhou, Lynn Lu, Yunlong Wang. **Innovative Dynamic Graph Network based Deep Learning Algorithms to Enhance Rare Disease Detection and Patient Feature Interaction Analysis**. 2022 PMSA Annual Conference, May 2022
67. Yong Cai, Wei Huang, Wenzhe Lu, Ruoxin Li, and Yanping Liu. **Benchmarking Performance of Various Promotional Channels by Brand, Lifecycle, and COVID**, 2022 PMSA Annual Conference, May 2022
68. Tong Wu, Yunlong Wang, Yoder Shawn, Yingli Yuan, **Multi-Indication Analytics from Longitudinal Prescription Data using Bayesian Two-Step Ensemble Model**, 2022 PMSA Annual Conference, May 2022
69. Ruoxin Li, Robert Kelly, Lihua Tan, **Deciphering Standing Orders - Attributing Prescriptions to Influencers via Machine Learning**, 2022 PMSA Annual Conference, May 2022

ASCO

70. Guanhao Wei, Li Zhou, Lynn Lu, Marc Romano. **Sequential EHR-based dynamic graph network for multiple myeloma detection and feature interaction investigation**. (2022): e13591-e13591, 2022 ASCO Annual Meeting

IJCAI

71. Yang, Chaoqi, Cheng Qian, and Jimeng Sun. **GOCPPT: Generalized Online Canonical Polyadic Tensor Factorization and Completion**. IJCAI, (2022).

PKDD

72. Jiaqi Wang, Cheng Qian, Suhan Cui, Lucas Glass, and Fenglong Ma, **Towards Federated COVID-19 Vaccine Side Effect Prediction**, PKDD, 2022

Conferences (continued)

73. Hui Jin; **Digital Transformation and Innovative Practice in China Healthcare Market**, Boehringer-Ingelheim BIX Open Day, Shanghai, Mar 2022
74. Ruoxin Li, Robert Kelly, Lihua Tan, **Deciphering Standing Orders - Attributing Prescriptions to Influencers via Machine Learning**, 2022 PMSA Annual Conference, May 2022

75. John Eichert, D. Bruce West, Guanhao Wei, Li Zhou, Lynn Lu. **AIML Powered Thought Leader Networks for Identifying HCP Relationships and Boosting Market Performance**. 2022 PMSA Annual Conference, May 2022
76. Guanhao Wei, Marc Romano, Li Zhou, Lynn Lu, Yunlong Wang. **Innovative Dynamic Graph Network based Deep Learning Algorithms to Enhance Rare Disease Detection and Patient Feature Interaction Analysis**. 2022 PMSA Annual Conference, May 2022
77. Hui Jin; **AI/ML application in Omni-Channel Engagement in China Pharma Market**, IQVIA TechIQ Forum, Shanghai, Sep 2022
78. Guanhao Wei, Li Zhou, Lynn Lu, Marc Romano. **Sequential EHR-based dynamic graph network for multiple myeloma detection and feature interaction investigation**. (2022): e13591-e13591, 2022 ASCO Annual Meeting
79. Lucas Glass. **Using Real World Data and AI/ML for Clinical Trial Site Matching**. Summit for Clinical Ops Executives (2022).
80. Pedro Manzione. **AI for Drug Repurposing**. Artificial Intelligence in Pharma Online Conference (2022)
81. Pedro Manzione. **AI for Drug Repurposing**. 3rd Annual Pharma AI Summit (2022).
82. Lucas Glass. **Using Real-World data and AI/ML for Clinical Trial Site Matching to Simultaneously Improve Enrollment Rate and Diversity**. DIA Global Annual Meeting (2022).
83. Johanna Karbe. **Using Machine Learning to Investigate Physician Potential in Clinical Trials in Germany — A case study of 5 pathology indications**. 2nd Edition Digital Pathology & AI Conference (2022).
84. Vishwaraj Doshi, Jie Hu and Do Young Eun, **“Bi-SIS Epidemics on Graphs – Quantitative Analysis of Coexistence Equilibria”**. 2022 61st IEEE Conference on Decision and Control (CDC), IEEE, 2022.
85. Wenbo Zhang, Tong Wu, Yunlong Wang, Yong Cai, and Hengrui Cai, **“On Causal Rationalization”**, In 36th Conference on Neural Information Processing Systems (NeurIPS), Causality for Real-World Impact Workshop (CML4Impact), 2022
86. Luning Bi, Yunlong Wang, Fan Zhang, Yong Cai, and Emily Zhao, **“FD-GATDR: A Federated-Decentralized-Learning Graph Attention Network for Doctor Recommendation Using EHR”**, Workshop on Data Science and Artificial Intelligence for Responsible Recommendations, 28th ACM SIGKDD conference on knowledge discovery & data mining (KDD), 2022.
87. Lockwood Taylor, Ruben Herman, Bernadette Dwan, Priscilla Velentgas, Elizabeth Powers, **A systematic process using robust signal detection and Contextualization methods in treescan® and E360® to reduce false Positives in routine pharmacovigilance**, August 2022 – ISPE Europe, <https://www.eventscribe.net/2022/ICPE/PosterTitles.asp?pfp=BrowsebyTitle>

88. Daniel B. Jernigan, MD, MPH, **CDC's Data Modernization Initiative... Changing the Way We Work** May 2022 - NCHS Board of Scientific Counselors, <https://www.cdc.gov/nchs/data/bsc/bsc-pres-dan-jernigan-5-26-2022.pdf>
89. Hui Jin; **Digital Transformation and Innovative Practice in China Healthcare Market**, Boehringer-Ingelheim BIX Open Day, Shanghai, Mar 2022

Articles (continued)

90. Qian, Cheng, Kejun Huang, Lucas Glass, Rakshith S. Srinivasa, and Jimeng Sun. **JULIA: Joint Multi-linear and Nonlinear Identification for Tensor Completion**. arXiv preprint arXiv:2202.00071 (2022).
91. Srinivasa, Rakshith S., Cheng Qian, Brandon Theodorou, Jeffrey Spaeder, Cao Xiao, Lucas Glass, and Jimeng Sun. **Clinical trial site matching with improved diversity using fair policy learning**. arXiv preprint arXiv:2204.06501 (2022).
92. Wu, Zhenbang, Cao Xiao, Lucas M. Glass, David M. Liebovitz, and Jimeng Sun. **AutoMap: Automatic Medical Code Mapping for Clinical Prediction Model Deployment**. arXiv preprint arXiv:2203.02446 (2022).
93. Yang, Chaoqi, Cheng Qian, Navjot Singh, Cao Xiao, M. Brandon Westover, Edgar Solomonik, and Jimeng Sun. **Augmented Tensor Decomposition with Stochastic Optimization**. arXiv preprint arXiv:2106.07900 (2021).
94. Hui Jin, Hanyu Gao, Suge Wang. **Key Social Advocate insight report for social media platform in China**

Whitepapers

95. Megan He, Hui Jin, Yue Wang, Fan Yang. **Artificial Intelligence and Machine Learning Empowers Healthcare in China: an Algorithm-Driven Approach**. IQVIA White Paper, Oct 2022
96. Arbuckle L, Collins J. **Advancing Privacy-Enhancing Technologies - Safe Data Enablement for Health Services & Research through Privacy-Enhancing Data Sharing and Analytics: A Spectrum of Perspectives** [Internet]. Ottawa, Canada: Privacy Analytics (an IQVIA company); 2022. Available from: <https://privacy-analytics.com/resources/white-papers/advancing-privacy-enhancing-technologies/>
97. Megan He, Hui Jin, Fan Yang, Yue Wang, Siyi Yu, Suge Wang, Yanxin Yang, Chenxi Yang, Hanyu Gao. **AIML Empowered Healthcare in China-an Algorithm based Approach**. IQVIA Whitepaper

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98. Lucas Glass. **Interview. Artificial Intelligence could Benefit all Aspects of Clinical Trials: IQVIA**. Outsourcing Pharma, 4 January 2022, <https://www.outsourcing-pharma.com/Article/2022/01/04/Artificial-intelligence-could-benefit-all-aspects-of-trials>

99. Lucas Glass. **Machine Learning-based Predictive Modeling: Notable Uses in Clinical Trials**. 2 February 2022, https://www.contractpharma.com/contents/view_online-exclusives/2022-02-11/machine-learning-based-predictive-modeling-notable-uses-in-clinical-trials/
100. Lucas Glass. **Using AI to Match Patients with Clinical Trials for Proactive Treatment**. HIT Consultant. 22 August 2022, <https://hitconsultant.net/2022/08/22/ai-clinical-trials-proactive-treatment/>

2021

Peer Reviewed Articles

101. Tong Wu, Yunlong Wang, Yue Wang, Emily Zhao, and Yilian Yuan. **Leveraging graph-based hierarchical medical entity embedding for healthcare applications**. *Scientific Reports* 11, no. 1 (2021): 1-13.
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