Topics	Paper ID	Title	Venue	Year	Difficulty	Keywords
adversarial learning	1	Treatment effect prediction with adversarial deep learning using electronic health records	BMC Medical Informatics and Decision Making	2020	hard	treatment effect prediction
adverse drug reaction	2	Adverse Drug Reaction Discovery from Electronic Health Records with Deep Neural Networks	Proceedings of the ACM Conference on Health, Inference, and Learning	2020	hard	
attention	3	An Interpretable Disease Onset Predictive Model Using Crossover Attention Mechanism From Electronic Health Records	IEEE Access	2019	easy	
attention	4	High-Risk Prediction of Cardiovascular Diseases via Attention-Based Deep Neural Networks	IEEE/ACM Transactions on Computational Biology and Bioinformatics	2021	easy	cardiovascular disease
attention	5	Extraction of information related to drug safety surveillance from electronic health record notes: Joint modeling of entities and relations using knowledge-aware neural attentive models	JMIR Medical Informatics	2020	hard	drug safety
attention	6	Automatic ICD code assignment of Chinese clinical notes based on multilayer attention BiRNN	Journal of Biomedical Informatics	2019	easy	ICD coding
attention	7	Explainable automated coding of clinical notes using hierarchical label-wise attention networks and label embedding initialisation	Journal of Biomedical Informatics	2021	hard	
attention	8	Identification of pediatric respiratory diseases using a fine-grained diagnosis system	Journal of Biomedical Informatics	2021	hard	clinical notes
attention	9	Using neural attention networks to detect adverse medical events from electronic health records	Journal of Biomedical Informatics	2018	easy	adverse event detection
attention	10	Asthma exacerbation prediction and risk factor analysis based on a time-sensitive, attentive neural network: Retrospective cohort study	Journal of Medical Internet Research	2020	easy	asthma
attention	11	Diagnosis Prediction via Medical Context Attention Networks Using Deep Generative Modeling	Proceedings - IEEE International Conference on Data Mining, ICDM	2018	hard	
attention	12	Predicting Prescriptions via DSCA-Dual Sequences with Cross Attention Network	2020 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)	2020	easy	
attention	13	BiteNet: Bidirectional Temporal Encoder Network to Predict Medical Outcomes	2020 IEEE International Conference on Data Mining (ICDM)	2020	hard	
attention	14	Medical named entity extraction from chinese resident admit notes using character and word attention-enhanced neural network	International Journal of Environmental Research and Public Health	2020	easy	
autoencoder	15	Interpreting clinical latent representations using autoencoders and probabilistic models	Artificial Intelligence in Medicine	2021	hard	
autoencoder	16	A Regularized Deep Learning Approach for Clinical Risk Prediction of Acute Coronary Syndrome Using Electronic Health Records	IEEE Transactions on Biomedical Engineering	2018	easy	heart disease
autoencoder	17	Identifying Sepsis Subphenotypes via Time-Aware Multi-Modal Auto-Encoder	Proceedings of the 26th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining	2020	hard	sepsis
autoencoder	18	Deep Learning-based Propensity Scores for Confounding Control in Comparative Effectiveness Research: A Large-scale, Real-world Data Study	Epidemiology	2021	hard	cancer
Autoencoder	19	Optimizing Autoencoders for Learning Deep Representations From Health Data	IEEE Journal of Biomedical and Health Informatics	2019	hard	
BERT	20	Med-BERT: pretrained contextualized embeddings on large-scale structured electronic health records for disease prediction	npj Digital Medicine	2021	hard	

Topics	Paper ID	Title	Venue	Year	Difficulty	Keywords
BERT	21	Applying interpretable deep learning models to identify chronic cough patients using EHR data	Computer Methods and Programs in Biomedicine	2021	easy	chronic cough
BERT	22	A corpus-driven standardization framework for encoding clinical problems with HL7 FHIR	Journal of Biomedical Informatics	2020	hard	FHIR
BERT	23	Cloud-based intelligent self-diagnosis and department recommendation service using Chinese medical BERT	Journal of Cloud Computing	2021	hard	
BERT	24	BEHRT: Transformer for Electronic Health Records	Scientific Reports	2020	hard	
Capsule network	25	Medical code prediction via capsule networks and ICD knowledge	BMC Medical Informatics and Decision Making	2021	hard	code prediction
causal	26	Estimating Individual Treatment Effects with Time-Varying Confounders	2020 IEEE International Conference on Data Mining (ICDM)	2020	hard	treatment effect
CNN	27	3D-CNN-SPP: A Patient Risk Prediction System From Electronic Health Records via 3D CNN and Spatial Pyramid Pooling	IEEE Transactions on Emerging Topics in Computational Intelligence	2021	hard	
CNN	28	Incorporating medical code descriptions for diagnosis prediction in healthcare	BMC Medical Informatics and Decision Making	2019	easy	predicting code
CNN	29	Medical concept embedding with variable temporal scopes for patient similarity	Engineering Letters	2020	hard	patient similarity
CNN	30	Diagnosing post-traumatic stress disorder using electronic medical record data	Health Informatics Journal	2021	easy	ptsd
CNN	31	A Novel Deep Similarity Learning Approach to Electronic Health Records Data	IEEE Access	2020	hard	
CNN	32	Deep Patient Similarity Learning for Personalized Healthcare	IEEE Transactions on NanoBioscience	2018	hard	patient similarity
CNN	33	Detection of bleeding events in electronic health record notes using convolutional neural network models enhanced with recurrent neural network autoencoders: Deep learning approach	JMIR Medical Informatics	2019	hard	
CNN	34	Predicting of anaphylaxis in big data EMR by exploring machine learning approaches	Journal of Biomedical Informatics	2018	easy	
CNN+RNN	35	UA-CRNN: Uncertainty-Aware Convolutional Recurrent Neural Network for Mortality Risk Prediction	Proceedings of the 28th ACM International Conference on Information and Knowledge Management	2019	hard	mortality
CNN+RNN+attention	36	Cohort selection for clinical trials using hierarchical neural network	Journal of the American Medical Informatics Association	2019	hard	clinical trial
concept linkage	37	Fine-Grained Concept Linking Using Neural Networks in Healthcare	Proceedings of the 2018 International Conference on Management of Data	2018	easy	
deep dictionary learning	38	DDL: Deep dictionary learning for predictive phenotyping	IJCAI International Joint Conference on Artificial Intelligence	2019	hard	
deidentification	39	A study of deep learning methods for de-identification of clinical notes in cross-institute settings	BMC Medical Informatics and Decision Making	2019	easy	
disease detection	40	Diagnosis Method of Thyroid Disease Combining Knowledge Graph and Deep Learning	IEEE Access	2020	hard	knowledge graph
disease detection	41	Disease Prediction and Early Intervention System Based on Symptom Similarity Analysis	IEEE Access	2019	hard	CNN
disease progression	42	Towards Predictive Analysis on Disease Progression: A Variational Hawkes Process Model	IEEE Journal of Biomedical and Health Informatics	2021	hard	Variational Hawkes Process

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drug recommendation	43	Drug package recommendation via interaction-aware graph induction	The Web Conference 2021 - Proceedings of the World Wide Web Conference, WWW 2021	2021	hard	
drug repurposing	44	Drug Repurposing for COVID-19 using Graph Neural Network with Genetic, Mechanistic, and Epidemiological Validation	Res Sq	2020	hard	
EHR representation learning	45	Deep Holistic Representation Learning from EHR	2018 12th International Symposium on Medical Information and Communication Technology (ISMICT)	2018	hard	
EHR representation learning	46	Bi-Dimensional Representation of Patients for Diagnosis Prediction	2019 IEEE 43rd Annual Computer Software and Applications Conference (COMPSAC)	2019	easy	
ELM	47	Application of an extreme learning machine network with particle swarm optimization in syndrome classification of primary liver cancer	Journal of Integrative Medicine	2021	hard	cancer
GAN	48	SeqMed: Recommending Medication Combination with Sequence Generative Adversarial Nets	2020 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)	2020	hard	
GCN	49	TAGNet: Temporal Aware Graph Convolution Network for Clinical Information Extraction	2020 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)	2020	hard	
GNN	50	Relational Learning Improves Prediction of Mortality in COVID-19 in the Intensive Care Unit	IEEE Transactions on Big Data	2021	hard	covid mortality
GNN	51	Pre-training of graph augmented transformers for medication recommendation	IJCAI International Joint Conference on Artificial Intelligence	2019	hard	medicaiton recommendation
GNN	52	Graph Neural Network-Based Diagnosis Prediction	Big Data	2020	hard	diagnosis prediction
GNN	53	Disease Prediction via Graph Neural Networks	IEEE Journal of Biomedical and Health Informatics	2021	hard	
GNN	54	Enrich rare disease phenotypic characterizations via a graph convolutional network based recommendation system	Proceedings - IEEE Symposium on Computer-Based Medical Systems	2020	hard	
GNN	55	Cross-Global Attention Graph Kernel Network Prediction of Drug Prescription	Proceedings of the 11th ACM International Conference on Bioinformatics, Computational Biology and Health Informatics, BCB 2020	2020	hard	medication recommendation
GNN	56	DeepNote-GNN: Predicting hospital readmission using clinical notes and patient network	Proceedings of the 12th ACM Conference on Bioinformatics, Computational Biology, and Health Informatics, BCB 2021	2021	hard	
GNN	57	Medical Entity Disambiguation Using Graph Neural Networks	Proceedings of the 2021 International Conference on Management of Data	2021	hard	medical entity disambiguation
GNN	58	Variationally Regularized Graph-Based Representation Learning for Electronic Health Records	Proceedings of the Conference on Health, Inference, and Learning	2021	hard	
GNN	59	Knowledge guided diagnosis prediction via graph spatial-temporal network	Proceedings of the 2020 SIAM International Conference on Data Mining, SDM 2020	2020	hard	
GNN	311	Online Disease Diagnosis with Inductive Heterogeneous Graph Convolutional Networks	Proceedings of the WWW 2021	2021	easy	
GNN+RL	60	Order-Free Medicine Combination Prediction with Graph Convolutional Reinforcement Learning	Proceedings of the 28th ACM International Conference on Information and Knowledge Management	2019	hard	medication prediction
graph attention	61	GATE: Graph-Attention Augmented Temporal Neural Network for Medication Recommendation	IEEE Access	2020	hard	medication recommendation
graph kernel	62	Multiple Graph Kernel Fusion Prediction of Drug Prescription	Proceedings of the 10th ACM International Conference on Bioinformatics, Computational Biology and Health Informatics	2019	hard	

Topics	Paper ID	Title	Venue	Year	Difficulty	Keywords
graph neural network	63	DUGRA: Dual-Graph Representation Learning for Health Information Networks	2020 IEEE International Conference on Big Data (Big Data)	2020	hard	literature
ICD coding	64	Applying convolutional neural networks to predict the ICD-9 codes of medical records	Sensors (Switzerland)	2020	easy	
information extraction	65	Adverse drug events and medication relation extraction in electronic health records with ensemble deep learning methods	Journal of the American Medical Informatics Association	2020	hard	adverse medication extraction
knowledge graph	66	Patient Representation Learning From Heterogeneous Data Sources and Knowledge Graphs Using Deep Collective Matrix Factorization: Evaluation Study	JMIR Med Inform	2022	hard	
knowledge graph	67	Effective Medical Archives Processing Using Knowledge Graphs	Proceedings of the 42nd International ACM SIGIR Conference on Research and Development in Information Retrieval	2019	easy	
language model	68	MuLan: Multilevel Language-based Representation Learning for Disease Progression Modeling	2020 IEEE International Conference on Big Data (Big Data)	2020	easy	sepsis shock
LSTM	69	Fully-connected LSTM–CRF on medical concept extraction	International Journal of Machine Learning and Cybernetics	2020	easy	concept extraction
medical coding	70	EHR Coding with Multi-Scale Feature Attention and Structured Knowledge Graph Propagation	Proceedings of the 28th ACM International Conference on Information and Knowledge Management	2019	hard	
medical imaging	71	Using Medical Imaging Effective Dose in Deep Learning Models: Estimation and Evaluation	IEEE Transactions on Radiation and Plasma Medical Sciences	2021	easy	
medication prediction	72	A hybrid method of recurrent neural network and graph neural network for next-period prescription prediction	International Journal of Machine Learning and Cybernetics	2020	hard	GNN, RNN
memory network	73	CAMP: Co-Attention Memory Networks for Diagnosis Prediction in Healthcare	2019 IEEE International Conference on Data Mining (ICDM)	2019	hard	diagnosis prediction
memory network	74	GAMENet: Graph augmented memory networks for recommending medication combination	33rd AAAI Conference on Artificial Intelligence, AAAI 2019, 31st Innovative Applications of Artificial Intelligence Conference, IAAI 2019 and the 9th AAAI Symposium on Educational Advances in Artificial Intelligence, EAAI 2019	2019	hard	medication recommendation
memory network	75	MERITS: Medication Recommendation for Chronic Disease with Irregular Time-Series	2021 IEEE International Conference on Data Mining (ICDM)	2021	hard	
meta learning	76	MetaPred: Meta-Learning for Clinical Risk Prediction with Limited Patient Electronic Health Records	Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining	2019	hard	
MLP	77	MediMLP: Using Grad-CAM to Extract Crucial Variables for Lung Cancer Postoperative Complication Prediction	IEEE Journal of Biomedical and Health Informatics	2020	hard	Lung cancer
NLP	78	Breast Cancer Classification with Electronic Medical Records Using Hierarchical Attention Bidirectional Networks	2018 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)	2018	hard	
NLP	79	Disease Inference with Symptom Extraction and Bidirectional Recurrent Neural Network	2018 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)	2018	easy	
NLP	80	Assertion Detection in Clinical Natural Language Processing: A Knowledge-Poor Machine Learning Approach	2019 IEEE 2nd International Conference on Information and Computer Technologies (ICICT)	2019	easy	
NLP	81	Knowledge-Aware Deep Dual Networks for Text-Based Mortality Prediction	2019 IEEE 35th International Conference on Data Engineering (ICDE)	2019	hard	
NLP	82	Med7: A transferable clinical natural language processing model for electronic health records	Artificial Intelligence in Medicine	2021	easy	
NLP	83	Prediction of breast cancer distant recurrence using natural language processing and knowledge-guided convolutional neural network	Artificial Intelligence in Medicine	2020	hard	cancer

Topics	Paper ID	Title	Venue	Year	Difficulty	Keywords
NLP	84	FarSight: Long-Term Disease Prediction Using Unstructured Clinical Nursing Notes	IEEE Transactions on Emerging Topics in Computing	2021	hard	
NLP	85	Natural language processing and recurrent network models for identifying genomic mutation-associated cancer treatment change from patient progress notes	JAMIA Open	2019	easy	RNN
NLP	86	Ensemble method-based extraction of medication and related information from clinical texts	Journal of the American Medical Informatics Association	2020	hard	medication extraction
NLP	87	Evaluating shallow and deep learning strategies for the 2018 n2c2 shared task on clinical text classification	Journal of the American Medical Informatics Association	2019	easy	
NLP	88	Learning Patient Representations from Text	NAACL HLT 2018 - Lexical and Computational Semantics, SEM 2018, Proceedings of the 7th Conference	2018	easy	
NLP	89	Natural language generation for electronic health records	NPJ Digit Med	2018	easy	
NLP	90	SurfCon: Synonym Discovery on Privacy-Aware Clinical Data	Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining	2019	hard	
NLP	91	Fall Detection in EHR using Word Embeddings and Deep Learning	2019 IEEE 19th International Conference on Bioinformatics and Bioengineering (BIBE)	2019	hard	
NLP	92	Learning Temporal Relevance in Longitudinal Medical Notes	2019 IEEE International Conference on Big Data (Big Data)	2019	hard	
NLP	93	Patient Entity Recognition by Automatic EHR Context Understanding and Deep Learning	2019 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)	2019	easy	patient entity recognition
NLP	94	Detection of medical text semantic similarity based on convolutional neural network	BMC Medical Informatics and Decision Making	2019	easy	
NLP	95	Identification of patients with carotid stenosis using natural language processing	European Radiology	2020	easy	RNN, CNN, attention
NLP	96	Analysis of adverse drug reactions identified in nursing notes using reinforcement learning	Healthcare Informatics Research	2020	hard	ADE in nursing notes
NLP	97	Ensembling Classical Machine Learning and Deep Learning Approaches for Morbidity Identification From Clinical Notes	IEEE Access	2021	hard	
NLP	98	Information Extraction for Intestinal Cancer Electronic Medical Records	IEEE Access	2020	easy	CNN, RNN
NLP	99	Natural Language Processing for EHR-Based Computational Phenotyping	IEEE/ACM Trans. Comput. Biol. Bioinformatics	2019	hard	phenotyping
NLP	100	A comprehensive study of mobility functioning information in clinical notes: Entity hierarchy, corpus annotation, and sequence labeling	International Journal of Medical Informatics	2021	hard	
NLP	101	Development and evaluation of novel ophthalmology domain-specific neural word embeddings to predict visual prognosis	International Journal of Medical Informatics	2021	easy	word embedding
NLP	102	Extraction of Family History Information From Clinical Notes: Deep Learning and Heuristics Approach	JMIR Med Inform	2020	hard	
NLP	103	Automatic detection of hypoglycemic events from the electronic health record notes of diabetes patients: Empirical study	JMIR Medical Informatics	2019	easy	
NLP	104	Hybrid deep learning for medication-related information extraction from clinical texts in French: MedExt algorithm development study	JMIR Medical Informatics	2021	easy	
NLP	105	Leveraging genetic reports and electronic health records for the prediction of primary cancers: Algorithm development and validation study	JMIR Medical Informatics	2021	hard	cancer

Topics	Paper ID	Title	Venue	Year	Difficulty	Keywords
NLP	106	Model-based reasoning of clinical diagnosis in integrative medicine: Real-world methodological study of electronic medical records and natural language processing methods	JMIR Medical Informatics	2020	easy	
NLP	107	Natural language processing for the identification of silent brain infarcts from neuroimaging reports	JMIR Medical Informatics	2019	easy	
NLP	108	Distant supervision for medical concept normalization	Journal of Biomedical Informatics	2020	hard	
NLP	109	Multimodal temporal-clinical note network for mortality prediction	Journal of Biomedical Semantics	2021	hard	mortality prediction
NLP	110	Early identification of patients with acute gastrointestinal bleeding using natural language processing and decision rules	Journal of Gastroenterology and Hepatology (Australia)	2021	hard	
NLP	111	Real-world Patient Trajectory Prediction from Clinical Notes Using Artificial Neural Networks and UMLS-Based Extraction of Concepts	Journal of Healthcare Informatics Research	2021	easy	
NLP	112	2018 n2c2 shared task on adverse drug events and medication extraction in electronic health records	Journal of the American Medical Informatics Association	2020	hard	adverse drug event
NLP	113	Identifying vulnerable older adult populations by contextualizing geriatric syndrome information in clinical notes of electronic health records	Journal of the American Medical Informatics Association	2019	hard	
NLP	114	Supporting the use of standardized nursing terminologies with automatic subject heading prediction: A comparison of sentence-level text classification methods	Journal of the American Medical Informatics Association	2020	easy	
NLP	115	A natural language processing and deep learning approach to identify child abuse from pediatric electronic medical records	PLoS ONE	2021	easy	child abuse detection
NLP	116	Comparing deep learning and concept extraction based methods for patient phenotyping from clinical narratives	PLoS ONE	2018	easy	
NLP	117	Natural language processing for cognitive therapy: Extracting schemas from thought records	PLoS ONE	2021	easy	
NLP	118	CausalTriad: Toward Pseudo Causal Relation Discovery and Hypotheses Generation from Medical Text Data	Proceedings of the 2018 ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics	2018	hard	
NLP	119	Extracting Medical Entities from Social Media	Proceedings of the ACM Conference on Health, Inference, and Learning	2020	easy	
NLP	120	MSA: Jointly Detecting Drug Name and Adverse Drug Reaction Mentioning Tweets with Multi-Head Self-Attention	Proceedings of the Twelfth ACM International Conference on Web Search and Data Mining	2019	hard	
NLP	121	Predicting Patient Readmission Risk from Medical Text via Knowledge Graph Enhanced Multiview Graph Convolution	SIGIR 2021 - Proceedings of the 44th International ACM SIGIR Conference on Research and Development in Information Retrieval	2021	hard	
NLP	122	Predicting Heart Failure Readmission from Clinical Notes Using Deep Learning	2019 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)	2019	easy	HF readmission prediction
NLP	123	Chinese Clinical Named Entity Recognition with Word-Level Information Incorporating Dictionaries	2019 International Joint Conference on Neural Networks (IJCNN)	2019	hard	name entity extraction
NLP	124	Extracting Smoking Status from Electronic Health Records Using NLP and Deep Learning	AMIA Jt Summits Transl Sci Proc	2020	easy	smoking
NLP	125	A Natural Language Processing Pipeline of Chinese Free-Text Radiology Reports for Liver Cancer Diagnosis	IEEE Access	2020	hard	
NLP	126	Testing Contextualized Word Embeddings to Improve NER in Spanish Clinical Case Narratives	IEEE Access	2020	easy	spanish clinical notes

Topics	Paper ID	Title	Venue	Year	Difficulty	Keywords
NLP	127	Clinical Data Extraction and Normalization of Cyrillic Electronic Health Records Via Deep-Learning Natural Language Processing	JCO Clinical Cancer Informatics	2019	easy	
NLP	128	Clinical named entity recognition from chinese electronic health records via machine learning methods	JMIR Medical Informatics	2018	easy	
NLP	129	Comparing information extraction techniques for low-prevalence concepts: The case of insulin rejection by patients	Journal of Biomedical Informatics	2019	easy	
NLP	130	Comparison of orthogonal NLP methods for clinical phenotyping and assessment of bone scan utilization among prostate cancer patients	Journal of Biomedical Informatics	2019	easy	
NLP	131	Incorporating dictionaries into deep neural networks for the Chinese clinical named entity recognition	Journal of Biomedical Informatics	2019	easy	
NLP	132	Prediction of stroke outcome using natural language processing-based machine learning of radiology report of brain MRI	Journal of Personalized Medicine	2020	easy	stroke
NLP	133	Using weak supervision and deep learning to classify clinical notes for identification of current suicidal ideation	Journal of Psychiatric Research	2021	easy	
NLP	134	Medical assertion classification in Chinese EMRs using attention enhanced neural network	Mathematical Biosciences and Engineering	2019	easy	
NLP	135	A disease inference method based on symptom extraction and bidirectional Long Short Term Memory networks	Methods	2020	easy	RNN
NLP	136	Deep Neural Learning for Automated Diagnostic Code Group Prediction Using Unstructured Nursing Notes	Proceedings of the 7th ACM IKDD CoDS and 25th COMAD	2020	hard	
NLP	137	Automated ICD-9-CM Medical Coding of Diabetic Patient's Clinical Reports	Proceedings of the First International Conference on Data Science, E-Learning and Information Systems	2018	easy	
NLP	138	Comparison of 2 Natural Language Processing Methods for Identification of Bleeding Among Critically Ill Patients	JAMA network open	2018	easy	bleeding detection
NLP - BERT	139	Deep Learning Identification of Asthma Inhaler Techniques in Clinical Notes	2020 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)	2020	easy	clinical notes, asthma
patient similarity	140	Patient Similarity via Joint Embeddings of Medical Knowledge Graph and Medical Entity Descriptions	IEEE Access	2020	hard	
patient trial matching	141	COMPOSE: Cross-Modal Pseudo-Siamese Network for Patient Trial Matching	Proceedings of the 26th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining	2020	hard	
patient trial matching	142	DeepEnroll: Patient-Trial Matching with Deep Embedding and Entailment Prediction	Proceedings of The Web Conference 2020	2020	hard	
phenotyping	143	Identification of asthma control factor in clinical notes using a hybrid deep learning model	BMC Medical Informatics and Decision Making	2021	easy	asthma
predictive	312	Lifelong Learning based Disease Diagnosis on Clinical Notes	Proceedings of the PAKDD 2021	2021	hard	
predictive model	145	Recent Temporal Pattern Mining for Septic Shock Early Prediction	2018 IEEE International Conference on Healthcare Informatics (ICHI)	2018	hard	
predictive model	146	Resset: A Recurrent Model for Sequence of Sets with Applications to Electronic Medical Records	2018 International Joint Conference on Neural Networks (IJCNN)	2018	hard	
predictive model	147	Multi-layer Facial Representation Learning for Early Prediction of Septic Shock	2019 IEEE International Conference on Big Data (Big Data)	2019	easy	sepsis shock
predictive model	148	Chasing Your Long Tails: Differentially Private Prediction in Health Care Settings	Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency	2021	hard	security

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predictive model	149	A Treatment Engine by Predicting Next-Period Prescriptions	Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining	2018	hard	
predictive model	150	Dual Memory Neural Computer for Asynchronous Two-View Sequential Learning	Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining	2018	hard	
predictive model	151	Identify Susceptible Locations in Medical Records via Adversarial Attacks on Deep Predictive Models	Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining	2018	easy	
predictive model	152	Learning Tasks for Multitask Learning: Heterogenous Patient Populations in the ICU	Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining	2018	easy	
predictive model	153	RAIM: Recurrent Attentive and Intensive Model of Multimodal Patient Monitoring Data	Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining	2018	hard	
predictive model	154	Risk Prediction on Electronic Health Records with Prior Medical Knowledge	Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining	2018	hard	
predictive model	155	TATC: Predicting Alzheimer's Disease with Actigraphy Data	Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining	2018	hard	
predictive model	156	A Robust Framework for Accelerated Outcome-Driven Risk Factor Identification from EHR	Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining	2019	easy	
predictive model	157	Attention and Memory-Augmented Networks for Dual-View Sequential Learning	Proceedings of the 26th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining	2020	hard	
predictive model	158	HiTANet: Hierarchical Time-Aware Attention Networks for Risk Prediction on Electronic Health Records	Proceedings of the 26th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining	2020	hard	
predictive model	159	INPREM: An Interpretable and Trustworthy Predictive Model for Healthcare	Proceedings of the 26th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining	2020	easy	
predictive model	160	Adversarial Cooperative Imitation Learning for Dynamic Treatment Regimes✱	Proceedings of The Web Conference 2020	2020	hard	
predictive model	161	DyCRS: Dynamic Interpretable Postoperative Complication Risk Scoring	Proceedings of The Web Conference 2020	2020	easy	
predictive model	162	StageNet: Stage-Aware Neural Networks for Health Risk Prediction	Proceedings of The Web Conference 2020	2020	easy	
predictive model	163	Completing Missing Prevalence Rates for Multiple Chronic Diseases by Jointly Leveraging Both Intra- and Inter-Disease Population Health Data Correlations	Proceedings of the Web Conference 2021	2021	easy	
predictive model	164	Distilling Knowledge from Publicly Available Online EMR Data to Emerging Epidemic for Prognosis	Proceedings of the Web Conference 2021	2021	easy	
predictive model	165	Improving Medical Code Prediction from Clinical Text via Incorporating Online Knowledge Sources	The World Wide Web Conference	2019	easy	
predictive model	166	Knowledge-Aware Assessment of Severity of Suicide Risk for Early Intervention	The World Wide Web Conference	2019	easy	
predictive model	167	Longitudinal Adversarial Attack on Electronic Health Records Data	The World Wide Web Conference	2019	hard	
predictive model	168	Predicting Clinical Visits Using Recurrent Neural Networks and Demographic Information	2018 IEEE 22nd International Conference on Computer Supported Cooperative Work in Design ((CSCWD))	2018	easy	
predictive model	169	An Effective Patient Representation Learning for Time-series Prediction Tasks Based on EHRs	2018 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)	2018	easy	
predictive model	170	Predicting Gastrointestinal Bleeding Events from Multimodal In-Hospital Electronic Health Records Using Deep Fusion Networks	2019 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)	2019	easy	

Topics	Paper ID	Title	Venue	Year	Difficulty	Keywords
predictive model	171	Design and implementation of a deep recurrent model for prediction of readmission in urgent care using electronic health records	2019 IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology (CIBCB)	2019	easy	
predictive model	172	Multiple MACE Risk Prediction using Multi-Task Recurrent Neural Network with Attention	2019 IEEE International Conference on Healthcare Informatics (ICHI)	2019	easy	risk prediction
predictive model	173	Diabetes Diagnosis and Treatment Research Based on Machine Learning	2019 IEEE SmartWorld, Ubiquitous Intelligence Computing, Advanced Trusted Computing, Scalable Computing Communications, Cloud Big Data Computing, Internet of People and Smart City Innovation (SmartWorld/SCALCOM/UIC/ATC/CBDCom/IOP/SCI)	2019	easy	diabetes
predictive model	174	ClinicNet: Clinical Practice Oriented Medical Representation Learning for Electronic Medical Records	2020 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)	2020	hard	mortality
predictive model	175	Predicting the Risk of Heart Failure With EHR Sequential Data Modeling	IEEE Access	2018	easy	heart failure prediction
predictive model	176	Artificial intelligence-based multimodal risk assessment model for surgical site infection (AMRAMS): Development and validation study	JMIR Medical Informatics	2020	easy	
predictive model	177	Improving current glycated hemoglobin prediction in adults: Use of machine learning algorithms with electronic health records	JMIR Medical Informatics	2021	easy	
predictive model	178	Deep learning predicts extreme preterm birth from electronic health records	Journal of Biomedical Informatics	2019	easy	
predictive model	179	Identifying Breast Cancer Distant Recurrences from Electronic Health Records Using Machine Learning	Journal of Healthcare Informatics Research	2019	easy	cancer
predictive model	180	Mapping patient trajectories using longitudinal extraction and deep learning in the MIMIC-III critical care database	Pacific Symposium on Biocomputing	2018	easy	
predictive model	181	PACE: Learning Effective Task Decomposition for Human-in-the-Loop Healthcare Delivery	Proceedings of the 2021 International Conference on Management of Data	2021	hard	healthcare delivery
predictive model	182	HeteroMed: Heterogeneous Information Network for Medical Diagnosis	Proceedings of the 27th ACM International Conference on Information and Knowledge Management	2018	hard	
predictive model	183	KAME: Knowledge-Based Attention Model for Diagnosis Prediction in Healthcare	Proceedings of the 27th ACM International Conference on Information and Knowledge Management	2018	hard	
predictive model	184	MHM: Multi-Modal Clinical Data Based Hierarchical Multi-Label Diagnosis Prediction	Proceedings of the 43rd International ACM SIGIR Conference on Research and Development in Information Retrieval	2020	hard	
predictive model	185	Disease State Prediction from Single-Cell Data Using Graph Attention Networks	Proceedings of the ACM Conference on Health, Inference, and Learning	2020	hard	
predictive model	186	Explaining an Increase in Predicted Risk for Clinical Alerts	Proceedings of the ACM Conference on Health, Inference, and Learning	2020	hard	
predictive model	187	MIMIC-Extract: A Data Extraction, Preprocessing, and Representation Pipeline for MIMIC-III	Proceedings of the ACM Conference on Health, Inference, and Learning	2020	hard	
predictive model	188	Temporal Pointwise Convolutional Networks for Length of Stay Prediction in the Intensive Care Unit	Proceedings of the Conference on Health, Inference, and Learning	2021	hard	
predictive model	189	Benchmarking Deep Learning Architectures for Predicting Readmission to the ICU and Describing Patients-at-Risk	Scientific Reports	2020	easy	
predictive model	190	Machine learning and deep learning to predict mortality in patients with spontaneous coronary artery dissection	Scientific reports	2021	easy	

Topics	Paper ID	Title	Venue	Year	Difficulty	Keywords
predictive model	191	Probabilistic Prognostic Estimates of Survival in Metastatic Cancer Patients (PPES-Met) Utilizing Free-Text Clinical Narratives	Scientific Reports	2018	easy	
predictive model	192	Health-ATM: A deep architecture for multifaceted patient health record representation and risk prediction	SIAM International Conference on Data Mining, SDM 2018	2018	hard	
predictive model	193	Learning robust patient representations from multi-modal electronic health records: A supervised deep learning approach	SIAM International Conference on Data Mining, SDM 2021	2021	easy	
predictive model	194	A predictive method to determine incomplete electronic medical records	SIGMIS-CPR 2018 - Proceedings of the 2018 ACM SIGMIS Conference on Computers and People Research	2018	easy	
predictive model	195	Learning to Detect Pathogenic Microorganism of Community-Acquired Pneumonia	The 41st International ACM SIGIR Conference on Research & Development in Information Retrieval	2018	easy	
predictive model	196	Multimodal Ensemble Approach to Incorporate Various Types of Clinical Notes for Predicting Readmission	2019 IEEE EMBS International Conference on Biomedical Health Informatics (BHI)	2019	easy	
predictive model	197	Predictive Multi-level Patient Representations from Electronic Health Records	2019 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)	2019	easy	
predictive model	198	Looking for low vision: Predicting visual prognosis by fusing structured and free-text data from electronic health records	International Journal of Medical Informatics	2022	easy	
predictive model	199	Development and Performance of the Pulmonary Embolism Result Forecast Model (PERFORM) for Computed Tomography Clinical Decision Support	JAMA Network Open	2019	easy	
predictive model	200	Label-indicator morpheme growth on LSTM for Chinese healthcare question department classification	Journal of Biomedical Informatics	2018	easy	
predictive model	201	Deep Learning for Identification of Adverse Drug Reaction Relations	Proceedings of the 2019 International Symposium on Signal Processing Systems	2019	easy	
predictive model	202	MiME: Multilevel Medical Embedding of Electronic Health Records for Predictive Healthcare	NIPS	2018	hard	
predictive model	203	DDL: Deep Dictionary Learning for Predictive Phenotyping"	IJCAI	2019	hard	
predictive model	204	RetainVis: Visual Analytics with Interpretable and Interactive Recurrent Neural Networks on Electronic Medical Records	IEEE Trans. Vis. Comput. Graph. 25 no. 1(2019):299-309	2019	hard	
predictive model	205	CONAN: Complementary Pattern Augmentation for Rare Disease Detection.	Proceedings of AAAI	2020	hard	
predictive model	206	Change Matters: Medication Change Prediction with Recurrent Residual Networks	IJCAI	2021	hard	
predictive model	207	STAN: spatio-temporal attention network for pandemic prediction using real-world evidence	JAMIA	2021	hard	
predictive model	208	SafeDrug: Dual Molecular Graph Encoders for Recommending Effective and Safe Drug Combinations	IJCAI	2021	hard	
predictive modeling	209	Learning the joint representation of heterogeneous temporal events for clinical endpoint prediction	32nd AAAI Conference on Artificial Intelligence, AAAI 2018	2018	hard	
predictive modeling	210	ConCare: Personalized clinical feature embedding via capturing the healthcare context	AAAI 2020 - 34th AAAI Conference on Artificial Intelligence	2020	hard	
predictive modeling	211	Improving clinical outcome predictions using convolution over medical entities with multimodal learning	Artificial Intelligence in Medicine	2021	easy	ICU
predictive modeling	212	Scalable and accurate deep learning with electronic health records	NPJ Digit Med	2018	easy	
predictive modeling	213	Deep representation learning of electronic health records to unlock patient stratification at scale	npj Digital Medicine	2020	easy	

Topics	Paper ID	Title	Venue	Year	Difficulty	Keywords
predictive modeling	214	Deep Thompson Sampling for Length of Stay Prediction	2021 International Joint Conference on Neural Networks (IJCNN)	2021	hard	length of stay prediction
predictive modeling	215	Contextual Embeddings from Clinical Notes Improves Prediction of Sepsis	AMIA ... Annual Symposium proceedings. AMIA Symposium	2020	easy	sepsis
predictive modeling	216	Personalized prediction of drug efficacy for diabetes treatment via patient-level sequential modeling with neural networks	Artif Intell Med	2018	easy	diabetes
predictive modeling	217	CCAE: Cross-field categorical attributes embedding for cancer clinical endpoint prediction	Artificial Intelligence in Medicine	2020	easy	cancer
predictive modeling	219	JLAN: medical code prediction via joint learning attention networks and denoising mechanism	BMC Bioinformatics	2021	easy	medical coding
predictive modeling	220	A machine learning model to predict the risk of 30-day readmissions in patients with heart failure: A retrospective analysis of electronic medical records data	BMC Medical Informatics and Decision Making	2018	easy	readmission predictive
predictive modeling	221	An interpretable risk prediction model for healthcare with pattern attention	BMC Medical Informatics and Decision Making	2020	easy	
predictive modeling	222	Combining structured and unstructured data for predictive models: a deep learning approach	BMC Medical Informatics and Decision Making	2020	easy	
predictive modeling	223	Feature rearrangement based deep learning system for predicting heart failure mortality	Computer Methods and Programs in Biomedicine	2020	easy	heart failure mortality
predictive modeling	224	Predictive Analytics for Care and Management of Patients With Acute Diseases: Deep Learning-Based Method to Predict Crucial Complication Phenotypes	J Med Internet Res	2021	easy	complication
predictive modeling	225	A customizable deep learning model for nosocomial risk prediction from critical care notes with indirect supervision	Journal of the American Medical Informatics Association	2020	easy	
predictive modeling	226	An artificial intelligence approach to COVID-19 infection risk assessment in virtual visits: A case report	Journal of the American Medical Informatics Association	2020	easy	covid
predictive modeling	227	In-hospital resource utilization prediction from electronic medical records with deep learning	Knowledge-Based Systems	2021	easy	
predictive modeling	228	An interpretable deep-learning model for early prediction of sepsis in the emergency department	Patterns	2021	easy	
predictive modeling	229	Application of a time-series deep learning model to predict cardiac dysrhythmias in electronic health records	PLoS ONE	2021	easy	time series, cardiac dysrhythmia detection
predictive modeling	230	Combining patient visual timelines with deep learning to predict mortality	PLoS ONE	2019	easy	
predictive modeling	231	Predicting diabetes second-line therapy initiation in the Australian population via time span-guided neural attention network	PLoS ONE	2019	easy	
predictive modeling	232	Readmission prediction via deep contextual embedding of clinical concepts	PLoS ONE	2018	easy	readmission
predictive modeling	233	Melanoma Risk Prediction with Structured Electronic Health Records	Proceedings of the 2018 ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics	2018	easy	
predictive modeling	234	LSAN: Modeling Long-Term Dependencies and Short-Term Correlations with Hierarchical Attention for Risk Prediction	Proceedings of the 29th ACM International Conference on Information & Knowledge Management	2020	hard	
predictive modeling	235	Temporal Clustering with External Memory Network for Disease Progression Modeling	2021 IEEE International Conference on Data Mining (ICDM)	2021	hard	disease progression

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predictive modeling	236	Analysis of risk factor domains in psychosis patient health records	Journal of Biomedical Semantics	2019	easy	
predictive modeling	237	Machine Learning Models Prognosticate Functional Outcomes Better than Clinical Scores in Spontaneous Intracerebral Haemorrhage	Journal of Stroke and Cerebrovascular Diseases	2022	easy	
predictive modeling	238	Automated ICD-9 Coding via A Deep Learning Approach	IEEE/ACM Trans. Comput. Biol. Bioinformatics	2019	easy	covid prediction
predictive modeling	239	Richer fusion network for breast cancer classification based on multimodal data	BMC Medical Informatics and Decision Making	2021	easy	cancer
predictive modeling	240	Application of deep and machine learning techniques for multi-label classification performance on psychotic disorder diseases	Informatics in Medicine Unlocked	2021	easy	psychotic disorder
predictive modeling	241	Predicting post-stroke pneumonia using deep neural network approaches	International Journal of Medical Informatics	2019	easy	pneumonia
predictive modeling	242	Predicting the Mortality and Readmission of In-Hospital Cardiac Arrest Patients With Electronic Health Records: A Machine Learning Approach	J Med Internet Res	2021	easy	Mortality and Readmission
predictive modeling	243	Cardiac Complication Risk Profiling for Cancer Survivors via Multi-View Multi-Task Learning	2021 IEEE International Conference on Data Mining (ICDM)	2021	hard	medication recommendation
predictive modeling	244	AI-Driven Clinical Decision Support: Enhancing Disease Diagnosis Exploiting Patients Similarity	IEEE Access	2022	easy	patient similarity
predictve model	245	Construction of Knowledge Graph of HIV-associated Neurocognitive Disorders Syndrome based on Deep Learning	Proceedings - 2020 International Conference on Artificial Intelligence and Computer Engineering, ICAICE 2020	2020	easy	HIV
privacy, deidentification	246	Redaction of Protected Health Information in EHRs using CRFs and Bi-directional LSTMs	2018 7th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions) (ICRITO)	2018	easy	
prototype learning	247	PEARL: Prototype Learning via Rule Learning	Proceedings of the 10th ACM International Conference on Bioinformatics, Computational Biology and Health Informatics	2019	easy	
Q&A	248	Learning Contextualized Document Representations for Healthcare Answer Retrieval	Proceedings of The Web Conference 2020	2020	hard	
Q&A	249	Text-to-SQL Generation for Question Answering on Electronic Medical Records	Proceedings of The Web Conference 2020	2020	hard	
question & answering	250	Multi-Modal Knowledge-Aware Hierarchical Attention Network for Explainable Medical Question Answering	Proceedings of the 27th ACM International Conference on Multimedia	2019	hard	
readmission prediction	251	Predicting Hospital Readmission via Cost-Sensitive Deep Learning	IEEE/ACM Trans. Comput. Biol. Bioinformatics	2018	easy	
record linkage	252	Statistical supervised meta-ensemble algorithm for medical record linkage	Journal of Biomedical Informatics	2019	easy	record linkage
representation learning	253	Temporal Self-Attention Network for Medical Concept Embedding	2019 IEEE International Conference on Data Mining (ICDM)	2019	easy	mortality prediction
representation learning	254	Attentive Dual Embedding for Understanding Medical Concepts in Electronic Health Records	2019 International Joint Conference on Neural Networks (IJCNN)	2019	easy	clustering
representation learning	255	Time-Aware Multi-Type Data Fusion Representation Learning Framework for Risk Prediction of Cardiovascular Diseases	IEEE/ACM Trans Comput Biol Bioinform	2021	easy	
representation learning	256	Using indication embeddings to represent patient health for drug safety studies	JAMIA Open	2020	easy	drug safting
representation learning	257	Interpretable Representation Learning for Healthcare via Capturing Disease Progression through Time	Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining	2018	easy	

Topics	Paper ID	Title	Venue	Year	Difficulty	Keywords
representation learning	258	Hierarchical Attention Propagation for Healthcare Representation Learning	Proceedings of the 26th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining	2020	hard	
representation learning	259	Multi-task deep representation learning method for electronic health records	2020 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)	2020	hard	mortality
representation learning	260	Time-sensitive clinical concept embeddings learned from large electronic health records	BMC Medical Informatics and Decision Making	2019	easy	
representation learning	261	Med2Meta: Learning representations of medical concepts with meta-embeddings	HEALTHINF 2020 - 13th International Conference on Health Informatics, Proceedings; Part of 13th International Joint Conference on Biomedical Engineering Systems and Technologies, BIOSTEC 2020	2020	easy	
representation learning	262	HCET: Hierarchical Clinical Embedding With Topic Modeling on Electronic Health Records for Predicting Future Depression	IEEE Journal of Biomedical and Health Informatics	2021	easy	
representation learning	263	Deep representation learning for individualized treatment effect estimation using electronic health records	Journal of Biomedical Informatics	2019	easy	
representation learning	264	Generalized and transferable patient language representation for phenotyping with limited data	Journal of Biomedical Informatics	2021	hard	
representation learning	265	Harmonized representation learning on dynamic EHR graphs	Journal of Biomedical Informatics	2020	hard	
representation learning	266	Representation of EHR data for predictive modeling: A comparison between UMLS and other terminologies	Journal of the American Medical Informatics Association	2020	easy	
representation learning	267	Learning Electronic Health Records through Hyperbolic Embedding of Medical Ontologies	Proceedings of the 10th ACM International Conference on Bioinformatics, Computational Biology and Health Informatics	2019	easy	
representation learning	268	Matching in Selective and Balanced Representation Space for Treatment Effects Estimation	Proceedings of the 29th ACM International Conference on Information & Knowledge Management	2020	hard	
representation learning	269	An Embedding-Based Approach for Oral Disease Diagnosis Prediction from Electronic Medical Records	Proceedings of the 2nd International Conference on Medical and Health Informatics	2018	easy	
representation learning	270	Evaluating Semantic Textual Similarity in Clinical Sentences Using Deep Learning and Sentence Embeddings	Proceedings of the 35th Annual ACM Symposium on Applied Computing	2020	easy	
representation learning	271	Hurtful Words: Quantifying Biases in Clinical Contextual Word Embeddings	Proceedings of the ACM Conference on Health, Inference, and Learning	2020	easy	
representation learning	272	Leveraging graph-based hierarchical medical entity embedding for healthcare applications	Scientific Reports	2021	hard	
representation learning	273	Evaluating the Quality of Word Representation Models for Unstructured Clinical Text Based ICU Mortality Prediction	Proceedings of the 20th International Conference on Distributed Computing and Networking	2019	easy	
RNN	274	Enhanced character-level deep convolutional neural networks for cardiovascular disease prediction	BMC Medical Informatics and Decision Making	2020	hard	heart disease
RNN	275	Interpretable time-aware and co-occurrence-aware network for medical prediction	BMC Medical Informatics and Decision Making	2021	hard	
RNN	276	Utilizing dynamic treatment information for MACE prediction of acute coronary syndrome	BMC Medical Informatics and Decision Making	2019	easy	MACE prediction
RNN	277	Adverse Drug Event Detection from Electronic Health Records Using Hierarchical Recurrent Neural Networks with Dual-Level Embedding	Drug Safety	2019	hard	adverse drug event
RNN	278	Patient2Vec: A Personalized Interpretable Deep Representation of the Longitudinal Electronic Health Record	IEEE Access	2018	easy	
RNN	279	Bidirectional Representation Learning From Transformers Using Multimodal Electronic Health Record Data to Predict Depression	IEEE Journal of Biomedical and Health Informatics	2021	hard	depression prediction

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RNN	280	Deep Sequential Models for Suicidal Ideation From Multiple Source Data	IEEE Journal of Biomedical and Health Informatics	2019	easy	suicide prevention
RNN	281	Exploring Joint AB-LSTM With Embedded Lemmas for Adverse Drug Reaction Discovery	IEEE Journal of Biomedical and Health Informatics	2019	easy	
RNN	282	On Clinical Event Prediction in Patient Treatment Trajectory Using Longitudinal Electronic Health Records	IEEE Journal of Biomedical and Health Informatics	2020	hard	treatment prediction
RNN	283	Categorization of free-text drug orders using character-level recurrent neural networks	International Journal of Medical Informatics	2019	easy	NLP
RNN	284	Towards automated clinical coding	International Journal of Medical Informatics	2018	easy	clinical coding
RNN	285	Artificial Intelligence Algorithm with ICD Coding Technology Guided by the Embedded Electronic Medical Record System in Medical Record Information Management	J Healthc Eng	2021	easy	ICD coding
RNN	286	Endpoint prediction of heart failure using electronic health records	Journal of Biomedical Informatics	2020	easy	heart failure prediction
RNN	287	RAHM: Relation augmented hierarchical multi-task learning framework for reasonable medication stocking	Journal of Biomedical Informatics	2020	hard	medication stocking
RNN	288	Readmission prediction using deep learning on electronic health records	Journal of Biomedical Informatics	2019	easy	readmission
RNN	289	The impact of extraneous features on the performance of recurrent neural network models in clinical tasks	Journal of Biomedical Informatics	2020	easy	readmission, mortality, ICU-free days
RNN	290	Learning latent space representations to predict patient outcomes: Model development and validation	Journal of Medical Internet Research	2020	easy	representation learning
RNN	291	LSTM Model for Prediction of Heart Failure in Big Data	Journal of Medical Systems	2019	easy	HF
RNN	292	Monitoring ICU mortality risk with a long short-Term memory recurrent neural network	Pacific Symposium on Biocomputing	2020	easy	
RNN	293	Using machine learning for predicting cervical cancer from Swedish electronic health records by mining hierarchical representations	PLoS ONE	2020	easy	
RNN	294	KGDAL: Knowledge graph guided double attention LSTM for rolling mortality prediction for AKI-D patients	Proceedings of the 12th ACM Conference on Bioinformatics, Computational Biology, and Health Informatics, BCB 2021	2021	hard	
RNN	295	A BiLSTM-CRF Method to Chinese Electronic Medical Record Named Entity Recognition	Proceedings of the 2018 International Conference on Algorithms, Computing and Artificial Intelligence	2018	easy	
RNN	296	Marrying medical domain knowledge with deep learning on electronic health records: A deep visual analytics approach	Journal of Medical Internet Research	2020	easy	
RNN+CNN	297	Identifying relations of medications with adverse drug events using recurrent convolutional neural networks and gradient boosting	Journal of the American Medical Informatics Association	2020	easy	adverse drug event
RNN+CNN	298	Optimizing clinical trials recruitment via deep learning	Journal of the American Medical Informatics Association	2019	hard	trial recruitment
self supervised	299	Disease concept-embedding based on the self-supervised method for medical information extraction from electronic health records and disease retrieval: Algorithm development and validation study	Journal of Medical Internet Research	2021	hard	
self-supervised	300	Self-Supervised Graph Learning With Hyperbolic Embedding for Temporal Health Event Prediction	IEEE Trans Cybern	2021	hard	hyperbolic embedding
survival analysis	301	A Deep Active Survival Analysis approach for precision treatment recommendations: Application of prostate cancer	Expert Systems with Applications	2019	easy	

Topics	Paper ID	Title	Venue	Year	Difficulty	Keywords
survival analysis	313	SurvTRACE: Transformers for Survival Analysis with Competing Events	Arxiv	2021	hard	
time series	302	Adversarial Representation Learning for Robust Patient-Independent Epileptic Seizure Detection	IEEE Journal of Biomedical and Health Informatics	2020	easy	seizure detection, adversarial learning
time series prediction	303	Representation learning for clinical time series prediction tasks in electronic health records	BMC Medical Informatics and Decision Making	2019	easy	
transfer learning	304	An Adversarial Domain Separation Framework for Septic Shock Early Prediction Across EHR Systems	2020 IEEE International Conference on Big Data (Big Data)	2020	easy	sepsis shock
transfer learning	305	Improving prediction for medical institution with limited patient data: Leveraging hospital-specific data based on multicenter collaborative research network	Artificial Intelligence in Medicine	2021	hard	cancer
Transformer	306	Decoder Transformer for Temporally-Embedded Health Outcome Predictions	2021 20th IEEE International Conference on Machine Learning and Applications (ICMLA)	2021	hard	
treatment recommendation	307	Supervised Reinforcement Learning with Recurrent Neural Network for Dynamic Treatment Recommendation	Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining	2018	hard	
uncertainty	308	Analyzing the Role of Model Uncertainty for Electronic Health Records	Proceedings of the ACM Conference on Health, Inference, and Learning	2020	hard	
unsupervised learning	309	Mining incomplete clinical data for the early assessment of Kawasaki disease based on feature clustering and convolutional neural networks	Artificial Intelligence in Medicine	2020	easy	kawasaki
word embedding	310	ICD-9 Tagging of Clinical Notes Using Topical Word Embedding	Proceedings of the 2018 International Conference on Internet and E-Business	2018	easy	