

CURRICULUM VITAE
University of Pittsburgh
School of Medicine

BIOGRAPHICAL

Name: Denis R. Newman-Griffis	Business Address: 5607 Baum Boulevard Pittsburgh, PA 15206
Home Address:	Business Phone: (412) 648-9300
Home Phone:	Business Fax: (412) 648-9118
	Email: dnewmangriffis@pitt.edu

EDUCATION and TRAINING

UNDERGRADUATE

2008 - 2012	Carleton College Northfield, MN, USA	BA, 2012	Computer Science / Russian
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GRADUATE

2014 - 2020	The Ohio State University Columbus, OH, USA	MS, 2017 PhD, 2020	Computer Science and Engineering Adv: Eric Fosler-Lussier, Albert M Lai
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POSTGRADUATE

2020 - present	University of Pittsburgh Pittsburgh, PA, USA	Post-Doctoral	Biomedical Informatics Adv: Harry Hochheiser
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APPOINTMENTS and POSITIONS

ACADEMIC

2020 - present	School of Medicine University of Pittsburgh Pittsburgh, PA, USA	NLM Postdoctoral Fellow Biomedical Informatics Training Program
2014 – 2020	School of Engineering The Ohio State University	Graduate Student

Columbus, OH, USA
Computer Science and
Engineering

NON-ACADEMIC

2021 – present	VA Pittsburgh Health System Pittsburgh, PA, USA	Affiliated Fellow Center for Health Equity Research and Promotion
2020 – present	NIH Clinical Center Bethesda, MD, USA	Visiting Postdoctoral Fellow Rehabilitation Medicine
2015 – 2020	NIH Clinical Center Bethesda, MD, USA	Pre-Doctoral Fellow Rehabilitation Medicine
2012 – 2014	Fulcrum Software Solutions Dublin, OH, USA	Software Developer

MEMBERSHIP in PROFESSIONAL and SCIENTIFIC SOCIETIES

American Medical Informatics Association	2016 – present
Association for Computational Linguistics	2017 – present
Association for Computing Machinery	2015 – present
American Society for Engineering Education	2017 – present

HONORS

NIH Clinical Center Pre-Doctoral Fellowship (100% support)	2015 – 2020
NLM Postdoctoral Fellowship (100% support)	2020 – present

PUBLICATIONS

ORIGINAL PEER REVIEWED ARTICLES

1. **Griffis DR**, Shivade C, Fosler-Lussier E, Lai AM. A Quantitative and Qualitative Evaluation of Sentence Boundary Detection for the Clinical Domain. AMIA Joint Summits on Translational Science Proceedings. 2016;2016:8-97. PMID: 27570656. PMCID: PMC5001746.
2. **Newman-Griffis D**, Lai AM, Fosler-Lussier E. Insights into Analogy Completion from the Biomedical Domain. Proc BioNLP 2017. 2017;19-28. DOI: 10.18653/v1/W17-2303.
3. **Newman-Griffis D**, Lai AM, Fosler-Lussier E. Jointly Embedding Entities and Text with Distant Supervision. Proc Third Workshop on Representation Learning for NLP. 2018;195-206. DOI: 10.18653/v1/W18-3026.

4. **Newman-Griffis D**, Zirikly A. Embedding Transfer for Low-Resource Medical Named Entity Recognition: A Case Study on Patient Mobility. Proc BioNLP 2018. 2018;1-11. DOI: 10.18653/v1/W18-2301.
5. **Newman-Griffis D**, Zirikly A, Divita G, Desmet B. Classifying the reported ability in clinical mobility descriptions. Proceedings of the 18th BioNLP Workshop and Shared Task. 2019;1-10. DOI: 10.18653/v1/W19-5001.
6. Whitaker B, **Newman-Griffis D**, Haldar A, Ferhatosmanoglu H, Fosler-Lussier E. Characterizing the Impact of Geometric Properties of Word Embeddings on Task Performance. Proceedings of the 3rd Workshop on Evaluating Vector Space Representations for NLP. 2019;8–17. DOI: 10.18653/v1/W19-2002.
7. **Newman-Griffis D**, Fosler-Lussier E. Writing habits and telltale neighbors: analyzing clinical concept usage patterns with sublanguage embeddings. Proc Tenth Intl Workshop Health Text Mining and Information Analysis (LOUHI). 2019;146-156. DOI: 10.18653/v1/D19-6218.
8. **Newman-Griffis D**, Porcino J, Zirikly A, Thieu T, Camacho Maldonado J, Ho PS, Ding M, Chan L, Rasch E. Broadening horizons: the case for capturing function and the role of health informatics in its use. BMC Public Health. 2019 Oct 15;19(1):1288. DOI: 10.1186/s12889-019-7630-3. PubMed PMID: 31615472; PubMed Central PMCID: PMC6794808.
9. **Newman-Griffis D**, Fosler-Lussier E. HARE: a Flexible Highlighting Annotator for Ranking and Exploration. Proceedings of the 2019 Conference on Empirical Methods in Natural Language Processing and the 9th International Joint Conference on Natural Language Processing (EMNLP-IJCNLP): System Demonstrations. 2019;85-90. DOI: 10.18653/v1/D19-3015.
10. Moon GE, **Newman-Griffis D**, Kim J, Sukumaran-Rajam A, Fosler-Lussier E, Sadayappan P. Parallel Data-Local Training for Optimizing Word2Vec Embeddings for Word and Graph embeddings. Proc 5th Workshop on Machine Learning in HPC Environments. 2019;44-55. DOI: 10.1109/MLHPC49564.2019.00010.
11. Desmet B, Porcino J, Zirikly A, **Newman-Griffis D**, Divita G, Rasch E. Development of Natural Language Processing Tools to Support Determination of Federal Disability Benefits in the U.S. Proceedings of the 1st Workshop on Language Technologies for Government and Public Administration (LT4Gov). 2020;1-6.
12. **Newman-Griffis D**, Divita G, Desmet B, Zirikly A, Rosé CP, Fosler-Lussier E. Ambiguity in medical concept normalization: An analysis of types and coverage in electronic health record datasets. J Am Med Inform Assoc. (2021). 28(3);516-532 Dec 15. DOI: 10.1093/jamia/ocaa269. PubMed PMID: 33319905.
13. Thieu T, Camacho Maldonado J, Ho PS, Ding M, Marr A, Brandt D, **Newman-Griffis D**, Zirikly A, Chan L, Rasch E. A comprehensive study of mobility functioning information in clinical notes: Entity hierarchy, corpus annotation, and sequence labeling. Int J Med Inform. 2021 Mar;147:104351. DOI: 10.1016/j.ijmedinf.2020.104351. PubMed PMID: 33401169.

14. **Newman-Griffis D**, Fosler-Lussier E. Automated Coding of Under-Studied Medical Concept Domains: Linking Physical Activity Reports to the International Classification of Functioning, Disability, and Health. *Front Digit Health*. (2021). 3;620828. DOI: 10.3389/fdgth.2021.620828.
15. **Newman-Griffis D**, Lehman JF, Rosé CP, Hochheiser H. Translational NLP: A New Paradigm and General Principles for Natural Language Processing Research. *Proceedings of the 2021 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies*. (2021). 4125-4138.
16. **Newman-Griffis D**, Sivaraman V, Perer A, Fosler-Lussier E, Hochheiser H. TextEssence: A Tool for Interactive Analysis of Semantic Shifts Between Corpora. *Proceedings of the 2021 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies: Demonstrations*. (2021). 106-116.
17. Lovelace J, **Newman-Griffis D**, Vashishth S, Lehman JF, Rosé C. Robust Knowledge Graph Completion with Stacked Convolutions and a Student Re-Ranking Network. *Proc Joint Conference of the 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint Conference on Natural Language Processing (ACL-IJCNLP 2021)*. 2021, to appear.
18. Vashishth S, **Newman-Griffis D**, Joshi R, Dutt R, Rosé C. Improving Broad-Coverage Medical Entity Linking with Semantic Type Prediction and Large-Scale Datasets. *J Biomed Inform*. In Press.

OTHER PEER REVIEWED PUBLICATIONS

1. Thieu T, Camacho J, Ho P, Porcino J, Ding M, Nelson L, Rasch E, Zhou C, Chan L, Brandt D, **Newman-Griffis D**, Yuan A, Lai A. Inductive identification of functional status information and establishing a gold standard corpus: A case study on the Mobility domain. *2017 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*. 2017;2319-2321. DOI: 10.1109/BIBM.2017.8218042.
2. Taneja SB, Boyce RD, Reynolds WT, **Newman-Griffis D**. Introducing Information Retrieval for Biomedical Informatics Students. *Proc Fifth Workshop on Teaching NLP*. (2021). 96-98.
Included dissemination of three programming activities for biomedical informatics students to get hands-on experience with NLP: https://github.com/dbmi-pitt/bioinf_teachingNLP.

OTHER NON-PEER REVIEWED PUBLICATIONS

1. **Newman-Griffis D**, Fosler-Lussier E. Second-Order Word Embeddings from Nearest Neighbor Topological Features. *arXiv pre-print: arXiv:1705.08488*. 2017.
2. **Newman-Griffis D**, Pakhomov SV, Tamang S, Zirikly A, Desmet B, Liu H, Tsujii J, eds. *Proceedings of the First Workshop on Artificial Intelligence for Function, Disability, and*

ABSTRACTS (not published in Scientific Journals)

1. **Newman-Griffis D**, Thieu T, Zhou C, Brandt D, Camacho Maldonado J, Porcino J, Lai AM, Chan L. Characterizing the language of functioning: A corpus analysis illustrating how human function is described in clinical text. Poster presented at: AMIA Joint Summits on Translational Informatics; 2017 March 27-30, San Francisco, CA.
2. **Newman-Griffis DR**, Lai A, Fosler-Lussier E. A Weakly-Supervised Method for Jointly Embedding Words, Phrases, and Concepts. Poster presented at: Midwest Speech and Language Days; 2017 May 4-5, Chicago, IL.
3. **Newman-Griffis D**, Lai AM, Fosler-Lussier E. Jointly embedding biomedical entities and text with distant supervision. Poster presented at: AMIA Joint Summits on Translational Informatics; 2018 March 12-15, San Francisco, CA.
4. **Newman-Griffis D**, Zirikly A. Embedding Transfer for Low-Resource Medical Named Entity Recognition: A Case Study on Patient Mobility. Oral presentation at: Midwest Speech and Language Days; 2018 May 10-11, Notre Dame, IN.
5. **Newman-Griffis D**, Zirikly A. Embedding Transfer for Low-Resource Medical Named Entity Recognition: A Case Study on Patient Mobility. Poster presented at: First Workshop on Deep Learning Approaches for Low Resource Natural Language Processing (DeepLo); 2018 July 19, Melbourne, Australia.
6. **Newman-Griffis D**. Kickstarting NLP for whole-person activity information with representation learning and data analysis. Oral presentation at: 2019 Healthcare Text Analytics Conference; 2019 April 24-25, Cardiff, United Kingdom.
7. **Newman-Griffis D**. Kickstarting NLP for whole-person activity information with representation learning and data analysis. Poster presented at: 2019 Annual Conference of the North American Chapter of the Association for Computational Linguistics, Student Research Workshop; 2019 June 2-7, Minneapolis, MN.
8. **Newman-Griffis D**, Breitfeller L, Divita G, Fiacco J, Fosler-Lussier E, Rosé CP. NIH-CMU at n2c2 Track 3: Analyzing multistage normalization with matching and concept embeddings. Poster presented at: n2c2 2019 Workshop of AMIA Annual Symposium; 2019 November 15, Washington, DC.
9. **Newman-Griffis D**, Zirikly A, Ho P-S, Camacho Maldonado J, Sacco M, Marr A, Lai AM, Fosler-Lussier E. Automated classification of mobility activities in free text clinical narratives. Poster presented at: AMIA Annual Symposium; 2019 November 16-20, Washington, DC.
10. **Newman-Griffis D**. Retrieval and Analysis of Mobility-Related Information from Free Text Clinical Reports. Oral presentation at: 34th Annual Hayes Graduate Research Forum; 2020 February 28, Columbus, OH. 2nd Place Oral Presenter, Engineering.
11. **Newman-Griffis D**, Camacho Maldonado J, Ho P-S, Lai AM, Fosler-Lussier E. Retrieving mobility information in Social Security Administration clinical records: evaluation of a

neural relevance tagger. Poster presented at: AMIA Virtual Annual Symposium; 2020 November 14-18, Online.

12. **Newman-Griffis D**, Divita G, Desmet B, Zirikly A, Fosler-Lussier E, Rosé CP. Ambiguity in medical concept normalization: An analysis of types and coverage in electronic health record datasets. Oral presentation at: AMIA Virtual Annual Symposium; 2020 November 14-18, Online.
13. Vashishth S, Joshi R, **Newman-Griffis D**, Dutt R, Rosé C. MedType: Improving Medical Entity Linking with Semantic Type Prediction. Poster presentation at: AMIA Virtual Informatics Summit; 2021 March 22-25, Online.

PROFESSIONAL ACTIVITIES

TEACHING

Graduate Student Teaching:

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| 8/2017-12/2017 | Instructor, CSE 3521 Survey of Artificial Intelligence I: Basic Techniques. Undergraduate course, 40 students. The Ohio State University, Department of Computer Science and Engineering. 3 50-minute sessions/week. Responsible for creating and delivering all class material and assessments. |
| 3/2017 | Guest lecture, CSE 5522, Survey of Artificial Intelligence II: Advanced Techniques. Mixed graduate/undergraduate course, 40 students. The Ohio State University, Department of Computer Science and Engineering. 1 50-minute session. |
| 4/2018 | Guest lecture, CSE 5525, Deep Learning. Graduate course, 25 students. The Ohio State University, Department of Computer Science and Engineering. 1 50-minute session. |
| 11/2018 | Guest lecture, CSE 3521, Survey of Artificial Intelligence I: Basic Techniques. Undergraduate course, 40 students. The Ohio State University, Department of Computer Science and Engineering. 1 50-minute session. |
| 3/2019 | Guest lecture, CSE 3521, Survey of Artificial Intelligence I: Basic Techniques. Undergraduate course, 40 students. The Ohio State University, Department of Computer Science and Engineering. 1 50-minute session. |

Mentoring:

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| 8/2018-5/2019 | Research mentor, Brendan Whitaker, undergraduate Mathematics major at The Ohio State University. Supervised research project on geometric properties of word embedding representations.
Mentee achievements:
- 3 rd place presenter, Denman Undergraduate Research Forum, Statistical and |
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Mathematical Modeling. The Ohio State University.

- First-authored, peer-reviewed publication in international computer science workshop (3rd Workshop on Evaluating Vector Space Representations for NLP)

- 9/2020-5/2021 Research mentor, Jack Goldman, high school student at Allderdice High School in Pittsburgh. Supervising research experience studying comorbidity patterns by racial identity in critical care admissions.
- 5/2021-7/2021 Research mentor, Jacqueline Penn, University of Pittsburgh Department of Biomedical Informatics Summer Short-Term Trainee Program. Supervising research experience on natural language processing technologies for analyzing health data.

RESEARCH

Journal refereeing

- 2019- Reviewer, Computational Linguistics.
- 2020-present Reviewer, BMC Medical Informatics and Decision Making.
- 2020-present Reviewer, Computers in Industry.
- 2020-present Reviewer, Informatics in Medicine Unlocked.
- 2020- Reviewer, IEEE Transactions on Audio Signal and Language Processing.
- 2021-present Review board member, Frontiers in Digital Health

Conference and workshop refereeing

- 2016-present Reviewer, Annual Meeting of the Association for Computational Linguistics
- 2016-present Reviewer, AMIA Annual Symposium
- 2017-present Reviewer, Conference on Empirical Methods in Natural Language Processing
- 2018-present Reviewer, ACL Student Research Workshop
- 2018-present Reviewer, International Conference on Computational Linguistics
- 2018-present Reviewer, AMIA Informatics Summit
- 2019-present Reviewer, BioNLP Workshop
- 2019 Reviewer, NAACL Student Research Workshop
- 2020-present Reviewer, Natural Language Processing for Medical Conversations
- 2020-present Reviewer, AAAI Conference on Artificial Intelligence
- 2021 Reviewer, EACL Student Research Workshop
- 2021-present Reviewer, North American Chapter of the Association for Computational Linguistics
- 2021-present Reviewer, NAACL Systems Demonstrations

LIST of CURRENT RESEARCH INTERESTS

Natural Language Processing
Artificial Intelligence
Machine Learning
Disability and Rehabilitation
Corpus Linguistics
Information Visualization
Medical Informatics

INVITED SEMINARS AND LECTURESHIPS

Local Presentations

- 9/2/2015 How to Read War and Peace in 30 Seconds: or An Introduction to Natural Language Processing. Dynamit, Columbus, OH.
- 9/16/2016 Representation Learning for Extracting Functional Information from Medical Texts. The Ohio State University, Artificial Intelligence Seminar Series, Columbus, OH.

National Presentations

- 3/16/2018 Natural language processing approaches to extracting patient functioning from clinical data. Stanford Center for Population Health Sciences, Stanford, CA.
- 10/21/2019 Indexing mobility information in medical evidence with natural language processing. U.S. Social Security Administration, Data Science Seminar Series. Baltimore, MD.
- 9/1/2020 The EHR Language Garden: Leveraging Variability in Health Documentation. George Washington University CTSI-CN Informatics Seminar Series. Washington, DC (Online).

International Presentations

- 1/7/2021 Moderator, Panel Discussion: Next Steps and Future Directions for AI for Function and Disability. First Workshop on Artificial Intelligence for Function, Disability, and Health.

SERVICE

University and Medical School Service

- 2016-2018 Coordinator, Artificial Intelligence Seminar Series, The Ohio State University.

2021-present Organizer, Pitt-CMU Medical Informatics Colloquium (PCMIC). Originated, organized, and led collaborative colloquium series bringing together researchers in the Pittsburgh scientific community interested in medical informatics.

National Service

2021 Session Chair, AMIA Informatics Summit 2021.

International Service

2020-2021 Lead Organizer, First Workshop on Artificial Intelligence for Function, Disability, and Health.

2021 Lead Organizer, Second Workshop on Artificial Intelligence for Function, Disability, and Health.