University of Pittsburgh

School of Medicine

**CURRICULUM VITAE**

**BIOGRAPHICAL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name:** | Eric V. Strobl | **Business Address:** | The Offices at Baum |  |
| **Email:** | eric.strobl@pitt.edu |  | 5607 Baum Blvd., Suite 523 |  |
|  | Pittsburgh, PA 15206 |  |
|  |  |  |  |
| **Web:** | github.com/ericstrobl | **Business Phone:** | (412) 624-5100 |  |

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**EDUCATION and TRAINING**

**UNDERGRADUATE**

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| --- | --- | --- | --- |
| **Dates Attended** | **Name and Location of Institution** | **Degree Received and Year** | **Major Subject** |
| 08/2005 – 05/2009 | University of California Berkeley  Berkeley, CA | B.A.  2009 | Molecular and Cell Biology (Neurobiology) |
| 08/2005 – 05/2009 | University of California Berkeley  Berkeley, CA | B.A.  2009 | Psychology |

**GRADUATE**

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| --- | --- | --- | --- |
| **Dates Attended** | **Name and Location of Institution** | **Degree Received and Year** | **Major Subject** |
| 07/2013 – 09/2017 | University of Pittsburgh  Pittsburgh, PA | Ph.D.  2017 | Biomedical Informatics |
| 07/2011 – 06/2013  10/2017 – 06/2019 | University of Pittsburgh  Pittsburgh, PA | M.D.  2019 | Medicine |

**POSTGRADUATE**

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| --- | --- | --- | --- |
| **Dates Attended** | **Name and Location of Institution** | **Degree Received and Year** | **Major Subject** |
| 07/2019 – 06/2022 | Vanderbilt Univ. Medical Center  Nashville, TN | Residency  2022 | Psychiatry |
| 07/2022 – 06/2024 | Vanderbilt Univ. Medical Center  Nashville, TN | Fellowship  2024 | Child and Adolescent  Psychiatry |

**APPOINTMENTS and POSITIONS**

**ACADEMIC**

|  |  |  |
| --- | --- | --- |
| **Years Inclusive** | **Name and Location of Institution** | **Rank/Title** |
| 05/2007 – 06/2009 | University of California San Francisco  San Francisco, CA | Research Assistant |
| 07/2009 – 06/2011 | University of California San Francisco  San Francisco, CA | Research Associate |
| 07/2024 – Current | University of Pittsburgh  Pittsburgh, PA | Assistant Professor (Tenure track) |

**CERTIFICATION and LICENSURE**

**SPECIALTY CERTIFICATION**

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| --- | --- |
| **Specialty and Certifying Board** | **Date** |
| Psychiatry, American Board of Psychiatry and Neurology | 12/2023 |
| Certificate in Electroconvulsive Therapy, Vanderbilt University Medical Center | 01/2024 |
| Child and Adolescent Psychiatry, American Board of Psychiatry and Neurology | Exam taken 09/2024; results released 12/2024 |

**MEDICAL or OTHER PROFESSIONAL LICENSURE**

|  |  |
| --- | --- |
| **Licensing Board/State** | **Date** |
| Board of Medical Examiners, Tennessee | 09/2023 |
| Board of Medicine, Pennsylvania | 03/2024 |

**HONORS**

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| **Title of Award** | **Awarding Organization** | **Year** |
| David Scholar Research Fellowship  (large college scholarship and stipend for 2 years) | University of California Berkeley | 2008 |
| Swan Psychology Research Award  (top undergraduate research thesis) | University of California Berkeley,  Dept of Psychology | 2009 |
| Medical Scientist Training Program  (full scholarship and stipend for MD/PhD) | University of Pittsburgh | 2011 |
| Best Student Poster | University of Pittsburgh,  Dept of Biomedical Informatics | 2013 |
| Best Student Paper of the Year | University of Pittsburgh,  Dept of Biomedical Informatics | 2014 |
| Roth Scholar Research Fellowship | University of Pittsburgh,  Dept of Psychiatry | 2016 |
| Best Student Poster | University of Pittsburgh,  Dept of Biomedical Informatics | 2016 |
| Hamilton Scholar Award  (top graduating MSTP student in research) | University of Pittsburgh,  Medical Scientist Training Program | 2018 |
| Best Paper Award | Association for Computing Machinery  Bioinformatics and Computational Biology | 2021 |
| Research Award  (top graduating resident/fellow in research) | Vanderbilt University Medical Center, Dept of Psychiatry | 2024 |

**PUBLICATIONS**

1. ORIGINAL PEER REVIEWED ARTICLES

**Original Peer Reviewed Journal Articles**

1. Woolley JD, **Strobl EV**, Shelly WB, Karydas AM, Robin Ketelle RN, Wolkowitz OM, Miller BL, Rankin KP. BDNF serum concentrations show no relationship with diagnostic group or medication status in neurodegenerative disease. *Current Alzheimer Research.* 2012 Sep;9(7):815-21. PMID: 21605064; PMCID: PMC3176995.
2. Woolley JD, **Strobl EV**, Sturm VE, Shany-Ur T, Poorzand P, Grossman S, Nguyen L, Eckart JA, Levenson RW, Seeley WW, Miller BL, Rankin KP. Impaired recognition and regulation of disgust is associated with distinct but partially overlapping patterns of decreased gray matter volume in the ventroanterior insula. *Biological Psychiatry.* 2015 Oct 1;78(7):505-14. PMID: 25890642; PMCID: PMC4529378.
3. **Strobl EV**, Visweswaran S. Markov boundary discovery with ridge regularized linear models. *Journal of Causal Inference*. 2016 Mar;4(1):31-48. PMID: 27170915; PMCID: PMC4861166.
4. **Strobl EV**, Spirtes P, Visweswaran S. Estimating and controlling the False Discovery Rate of the PC algorithm using edge-specific p-values. *ACM Transactions on Intelligent Systems and Technology*. 2019 Oct 10;10(5):1-37.
5. **Strobl EV**, Zhang K, Visweswaran S. Approximate kernel-based conditional independence tests for fast non-parametric causal discovery. *Journal of Causal Inference*. 2019 Mar;4(1):31-48.  **One of the most highly cited articles in journal’s history**
6. **Strobl EV**, Visweswaran S, Spirtes PL. Fast causal inference with non-random missingness by test-wise deletion. *International Journal of Data Science and Analytics*. 2018 Aug;6(1):47-62. PMID:31321289; PMCID: PMC6638553.
7. **Strobl EV**. A constraint-based algorithm for causal discovery with cycles, latent variables and selection bias. *International Journal of Data Science and Analytics*. 2019 Jul;8(1):33-56.
8. **Strobl EV**. Causal Discovery with a mixture of DAGs. *Machine Learning*. 2022 Mar;112(11):4201-4225. **Impact factor of 7.5**
9. **Strobl EV**. Automated Hyperparameter Selection for the PC Algorithm*. Pattern Recognition Letters*. 2021 Nov;151:288-293. **Impact factor of 5.1**
10. **Strobl EV**, Lasko T. Identifying patient specific root causes with the heteroscedastic noise model.  *Journal of Computational Science*. 2023 Sep 1;72:102099.
11. **Strobl EV**. Counterfactual Formulation of Patient-Specific Root Causes of Disease. *Journal of Biomedical Informatics*. 2024 Feb;150:104585. PMID: 38191012. **Impact factor of 4.5**
12. **Strobl EV**, Lasko T, Gamazon ER. Mitigating pathogenesis for target discovery and disease subtyping. *Computers in Biology and Medicine*. 2024 Mar;171:108122. PMID: 38417381; PMCID: PMC11256217. **Impact factor of 7.7**
13. Lasko T, **Strobl EV**, Stead WW. Why do probabilistic clinical models fail to transport between sites. *npj Digital Medicine*, 2024.
14. **Strobl EV**, Gamazon ER. Discovering root causal genes with high throughput perturbations. *eLife*. 2024. **Impact factor of 6.4**
15. **Strobl EV**, Gamazon ER. Transcriptome-wide root causal inference. *medRxiv*. 2024. (Under Review)

**Original Peer Reviewed Conference Proceedings**

1. **Strobl EV**, Visweswaran S. Deep multiple kernel learning. *12th International Conference on Machine Learning and Applications (ICMLA'13)*. 2013 Dec 4;2013:414-17.
2. **Strobl EV**, Visweswaran S. Markov blanket discovery using the conditional Hilbert Schmidt Independence Criterion. *NIPS 2013 Workshop on Large-scale Experiment Design and Inference of Causal Mechanisms*. 2013 Dec 9.
3. **Strobl EV**. Improved causal discovery from longitudinal data using a mixture of DAGs. *Proceedings of Machine Learning Research*. 2019 Aug 5; 104: 100-133.
4. **Strobl EV**, Visweswaran S. Dirac delta regression: conditional density estimation with clinical trials. *The KDD'21 Workshop on Causal Discovery*. 2021 Aug 2;2021:78-125. (PMLR).
5. **Strobl EV**, Lasko TA. Synthesized difference in differences. *12th ACM Conference on Bioinformatics, Computational Biology, and Health Informatics*. 2021 Aug 1;1-10.
6. **Strobl EV**, Lasko TA. Identifying patient-specific root causes of disease. *13th ACM International Conference on Bioinformatics, Computational Biology and Health Informatics.* 2022 Aug 7;1-10. **Oral presentation**
7. **Strobl EV**, Lasko TA. Generalizing clinical trials with convex hulls. *Conference on Causal Learning and Reasoning*. 2023 Aug 10: 197-221. (PMLR). **Oral presentation (9% acceptance rate)**
8. **Strobl EV**, Lasko TA. Sample-specific root causal inference with latent variables. *Conference on Causal Learning and Reasoning*. 2023 Aug 10:895-915. (PMLR).
9. **Strobl EV**. Root causal inference from single cell RNA sequencing with the negative binomial. *14th ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics*. 2023 Sep 3:1-10. **Regular oral presentation (10% acceptance rate)**
10. Mota MB, Still JM, Gamboa JL, **Strobl EV**, Stein CM, Kawai VK, Lasko T. A data-driven approach to discover and quantify systemic lupus erythematosus etiological heterogeneity from electronic health records. AMIA Annual Symposium Proceedings. 2024.(student’s paper, finalist for Innovation Award)

2. OTHER NON-PEER REVIEWED PUBLICATIONS

1. **Strobl EV**. *Causal Inference Under Non-Stationary Feedback*. Doctoral Dissertation, University of Pittsburgh, 2017.

**PROFESSIONAL ACTIVITIES**

**TEACHING**

**Graduate Student Teaching:**

|  |  |
| --- | --- |
| **Dates** | **Course/Topic and Location** |
| 08/2016 – 12/2016 | Introduction to Biomedical Informatics  University of Pittsburgh, Pittsburgh PA |
| 04/2024 | Lecture in Advanced Topics in Biomedical Causal Discovery  Vanderbilt University, Nashville TN |
| Fall 2024 | Two Lectures in Artificial Intelligence for Biomedical informatics  University of Pittsburgh, Pittsburgh PA |

**Medical Student Teaching:**

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| --- | --- |
| **Dates** | **Course/Topic and Location** |
| 07/2019 – 06/2023 | Psychiatry Clerkship  Vanderbilt University Medical Center, Nashville TN |

**Resident Teaching:**

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| --- | --- |
| **Dates** | **Course/Topic and Location** |
| 07/2021 – 06/2022 | Psychiatry Rotation for Neurology Residents  Vanderbilt University Medical Center, Nashville TN |
| 07/2022 – 06/2023 | Child and Adolescent Psychiatry Rotation for Child Neurology Residents  Vanderbilt University Medical Center, Nashville TN |

**Mentoring:**

*Primary Research Advisor:*

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| --- | --- | --- | --- |
| **Dates** | **Student Name** | **Program** | **Degree** |
| Fall 2024 – Current | Semmie Kim | Biomedical Informatics | PhD |

*Other Mentoring:*

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| --- | --- | --- | --- |
| **Dates** | **Student Name** | **Program** | **Nature of Mentoring** |
| Fall 2022 – Current | Marco Barbero Mota | Biomedical Informatics (MS & PhD at Vanderbilt) | Monthly meetings, root causal discovery research |

**RESEARCH**

**Pending Grant Support:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Grant Number** | **Grant Title** | **Role in Project**  **% Effort** | **Years**  **Inclusive** | **Source**  **$ Amount** | **Status** |
| K08 HG014002 | Identifying Root Causal Genes from Single Cell RNA Sequencing | PI  80% | 2024-2029 | NIH  1,164,326 | Resubmitting 11/2024 |
| DP2 OD038577 | Automated Discovery and Perturbation of Root Causal Genes | PI  80% | 2025-2030 | NHGRI  1,500,000 | Submitted  08/2024 |
| UPMC Enterprises | Implement an Integrated Patient Digital Twin and Patient Biomimetic Twin Precision Medicine Platform to Predict and Test Drug Responses and Safety | Co-I  10%  PI: Lans Taylor | 2025-2026 | UPMC  1,000,000 | Submitted 09/2024 |

**Prior Grant Support:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Grant Number** | **Grant Title** | **Role in Project**  **% Effort** | **Years**  **Inclusive** | **Source**  **$ Amount** |
| T15 LM007059 | Pittsburgh Biomedical Informatics Training Program | Trainee  100% | 2013-2017 | NLM |
| T32 GM008208 | Medical Scientist Training Program | Trainee  100% | 2011-2013, 2017-2019 | NIGMS |

**Other Research Related Activities:**

*Journal Refereeing:*

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| --- | --- |
| **Dates** | **Journal** |
| 2023 | *Journal of the American Statistical Association* |
| 2022 | *Artificial Intelligence* |
| 2022-2024 | *Journal of Biomedical Informatics* |
| 2024 | *Artificial Intelligence in Medicine* |
| 2021-2022 | *IEEE Transactions on Neural Networks and Learning Systems* |
| 2020 | *Annals of Statistics* |
| 2019 | *IEEE Access* |
| 2018-2019 | *ACM Transactions on Intelligent Systems and Technology* |
| 2018-2019 | *Neural Computing and Applications* |
| 2019 | *Wiley Interdisciplinary Reviews: Computational Statistics* |
| 2016-2017 | *International Journal of Data Science and Analytics* |
| 2017 | *Signal Processing* |
| 2024 | *Expert Systems and Applications* |
| 2024 | *Knowledge-Based Systems* |
| 2024 | *Journal of Clinical and Translational Sciences* |
| 2024 | *Neurocomputing* |
| 2024 | *Heliyon* |
| 2024 | *Journal of Clinical Epidemiology* |

*Conference Refereeing:*

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| --- | --- |
| **Dates** | **Conference** |
| 2018-2020 | *Association for the Advancement of Artificial Intelligence* |
| 2022-2024 | *Causal Learning and Reasoning* |
| 2016-2023 | *Knowledge Discovery and Data Mining* |
| 2017-2018, 2024 | *Uncertainty in Artificial Intelligence* |

**LIST OF CURRENT RESEARCH INTERESTS**

1. Causal discovery and inference
2. Root causes of disease
3. Translational bioinformatics
4. Autism, catatonia and schizophrenia

**INVITED SEMINARS AND LECTURESHIPS**

**Local:**

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| --- | --- | --- |
| **Date** | **Title** | **Venue and Location** |
| 06/2024 | Automated Discovery of the Root Causes of Disease | Vanderbilt University Medical Center,  Nashville TN |

**International:**

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| --- | --- | --- |
| **Dates** | **Title** | **Venue and Location** |
| 08/2021 | Synthesized Difference in Differences | ACM Bioinformatics and Computational Biology,  Virtual |
| 08/2022 | Identifying Patient Specific Root Causes of Disease | ACM Bioinformatics and Computational Biology,  Chicago IL |
| 04/2023 | Generalizing Clinical Trials with Convex Hulls | Causal Learning and Reasoning,  Tubingen Germany |
| 09/2023 | Root Causal Inference from Single Cell RNA Sequencing with the Negative Binomial | ACM Bioinformatics and Computational Biology,  Houston TX |
| 10/2024 | Automated Discovery of the Root Causes of Disease | Vanderbilt University Medical Center,  Nashville TN |
| 12/2024 | Increasing Trustworthiness through Causal Discovery (Workshop Keynote) | TrustML4Health Workshop, IEEE Big Data,  Washington DC |

**CLINICAL**

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| --- | --- | --- | --- |
| **Dates** | **Role** | **Setting** | **% Effort** |
| 07/2024 - Current | Attending Physician | Center for Autism and Developmental Disorders  Child and Adolescent Outpatient Clinic | 20% |

**SERVICE**

**Departmental Service:**

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| --- | --- | --- |
| **Dates** | **Role** | **Program** |
| 2024 – present | Member | Core Faculty in Biomedical Informatics Training Program |
| 2024 – present | Member | MSTP Admissions Committee for Biomedical Informatics |

**National Service:**

|  |  |  |
| --- | --- | --- |
| **Dates** | **Role** | **Program** |
| 2024 | Member in Organizing Committee | AMIA Informatics Summit |