

TED LADERAS, PHD

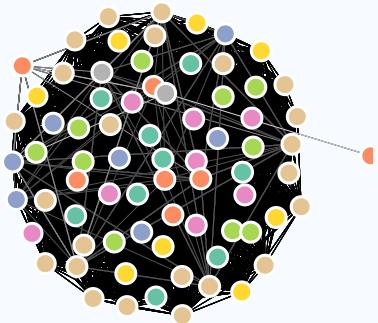
Assistant Professor, Division of Bioinformatics and Computational Biology,
Department of Medical Informatics and Clinical Epidemiology

Researcher, OHSU Knight Cancer Institute

Oregon Health & Science University

My research focus is on the Systems Biology of Complex Diseases. I use integrative modeling approaches across OMICs types to achieve this.

I am also passionate about teaching students to think about data, and have taught Data Science to a variety of groups, including graduate students, post-docs, staff, and clinicians. I am also an RStudio Certified Trainer in both the tidyverse and Shiny.



EDUCATION

- | | |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2014

2009 | <ul style="list-style-type: none">● PhD, Biomedical Informatics
Oregon Health & Science University 📍 Portland, OR<ul style="list-style-type: none">• Dissertation: Connecting Genotypes to Drug Sensitivities in HER2 Positive Cancer Cell Lines¹ |
| 2004

2002 | <ul style="list-style-type: none">● M.S., Biomedical Informatics
Oregon Health & Science University 📍 Portland, OR<ul style="list-style-type: none">• Thesis: Developing and validating a tool for microarray cluster analysis² |
| 1998

1994 | <ul style="list-style-type: none">● B.A., Chemistry
Reed College 📍 Portland, OR<ul style="list-style-type: none">• Thesis: Resonance-Raman Spectroscopy, Chromium Hexacarbonyl, and Me: A Tale of Intrigue |

View this CV online with links at laderast.github.io/cv

CONTACT

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- 🐦 [tladeras](#)
- 🔗 [github.com/laderast](#)
- 🔗 [laderast.github.io](#)
- 🔗 [linkedin](#)
- 📞 503-481-8470

LANGUAGE SKILLS



TEACHING

● **Teaching Statement**

Effective communication, hands-on learning, and mentoring are core to my teaching philosophy. I am a strong believer in enabling students in self-directed learning through hands-on workshops including both practical skills in bioinformatics (software development, design, and data analysis and visualization) and social skills essential to collaboration (interpretation and communication). In terms of practical skills, I have developed and contributed to a number of courses (Analytics, RBootcamp, Network Analysis, and BD2K skills courses) and workshops in a large variety of software development and communication topics. These topics include software design, interactive visualization, exploratory data analysis, and presentation of results.

In terms of fostering social and collaborative skills in students, I am a founder and co-leader of BioData-Club, a collaborative forum for students and postdocs to share and teach each other practical skills for success in a research environment. Through BioData Club, I have informally mentored a number of students through feedback and collaboration on workshops and presentations. I believe that by “training the trainers”, we can more effectively educate students in these skills in Data Science and Analytics.

In order to accomplish this training of trainers, my course materials are openly available for use and modification by other teachers. Because of my dedication to teaching and incorporation of student feedback, I have consistently high ratings from students in terms of teaching both long-form courses and short-term workshops.

COURSES

Current
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2015

● **BMI569: Data Analytics³**

Biomedical Informatics, Oregon Health & Science University
 Portland, OR

- Course co-director. Hybrid course co-taught with Kaiser Permanente Insight group.
- Winner of the Sakai Torchbearer Award 2020. Multiple nominations from students.
- Audience is both clinicians and bioinformaticians.

Current
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2020

● **HIP 523 Computerized Data Management**

Human Investigations Program, Oregon Health & Science University

- Course instructor. Taught two active lab sessions in exploratory data analysis and predictive modeling.

Current
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2020

● **BMI535/635: Management and Processing of Large Scale Data**

Biomedical Informatics, Oregon Health & Science University
 Portland, OR

- Course co-director. A course that focuses on UNIX scripting, parallel computing, and large scale databases.

- Current | 2020
- **BMI507: Ready for R⁴**
Biomedical Informatics, Oregon Health & Science University
📍 Portland, OR
 - Course Director. A gentle introduction to visualization, data transformation, and statistics using R and the tidyverse.
 - Course is open to anyone at <https://ready4r.netlify.app/mailing>
 - Currently over 1000 external students have enrolled.

Current | 2020

 - **NEUS643: Stats for Neuroscientists⁵**
Neuroscience Graduate Program, Oregon Health & Science University
📍 Portland, OR
 - Course Director. An introduction to image processing, statistics, and machine learning focusing on confocal microscopy data.
 - Lecture/Active Learning Labs using RStudio.cloud.

2019 | 2015

 - **BMI551/651 Bioinformatics and Computational Biology II: Statistical Methods**
Biomedical Informatics, Oregon Health & Science University
📍 Portland, OR
 - Course co-instructor. Provided drop-in sessions for R/Bioconductor programming and general tutoring.

2018 | 2017

 - **HMSP410/PHE427: Introduction to Health Informatics⁶**
Health Systems Management/Public Health Education, Portland State University
📍 Portland, OR
 - Course co-director. A gentle introduction to relevant data science and informatics concepts for undergraduate students.
 - Includes sections on data literacy, genomics, and metadata
 - **NEUS642: Python Bootcamp for Neuroscientists⁷**
Neuroscience Graduate Program, Oregon Health & Science University
📍 Portland, OR
 - Course director. Week long introduction to Python for non-computational neuroscientists.
 - With Daniela Saderi, Lucille Moore, Brad Buran, Charles Heller, Zack Swartz, Lisa Karstens, Stephen David, Michael Mooney.

EDUCATIONAL RESOURCES

- Current | 2015
- **RBootcamp⁸**
 - Online Interactive Introduction to the Tidyverse. Currently available as a free course to everyone.
 - Written with Jessica Minnier. Taken by incoming Bioinformatics students.

Current
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2017

- **Clinical Data Wrangling⁹**

- Multi-day workshop on understanding clinical data quality issues through both didactic lecturing and active data exploration.
- Written with Eilis Boudreau and Nicole Weiskopf.
- Given as an intro to both our incoming clinical and bioinformatics students.

Current
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2015

- **Introduction to iGraph¹⁰**

- Workshop introducing the basics of network analysis using the `igraph` package.
- Given for the last 4 years in Guanming Wu's Network Analysis course

2019
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2017

- **A gRadual Introduction to Shiny¹¹**

- Workshop introducing basic interactive visualization and dashboard building using the Shiny framework for R
- Written with Jessica Minnier
- Given for PDX R User Group and WNAR 2019. Used by multiple colleges, including Reed College and Lehmann College

2019

- **NHANES Data Scavenger Hunt¹²**

- An introduction to Exploratory Data Analysis using the `burro` app to explore outcomes using the NHANES (National Health and Nutrition Examination Survey) dataset.
- Written with Jessica Minnier and Thomas Frohwein

2019

- **How to make a reproducible paper¹³**

- Workshop introducing best practices in data management and code management to make an analysis reproducible.
- Written with Aurora Blucher. Given for BioData Club.

2019

- **Data Storytelling Workshop¹⁴**

- You are making a figure for your paper and want it to be the best it can be. Come and learn techniques for communicating your findings clearly. Learn about the role of color, annotations, and simplifying your figures to communicate effectively.
- Workshop given for BioData Club. RStudio materials can be freely accessed online.

2018

- **cvdRiskData Prediction Workshop¹⁵**

- A workshop given for Portland State University students exploring the difficulties of predicting cardiovascular risk using shiny for exploratory data analysis and caret for machine learning. Part 1 and Part 2.
- Written with David Dorr

2018
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2017

- **Data Literacy Tutorial¹⁶**
 - Interactive tutorial introducing the basic concepts of visualization and data literacy
 - Used in both HMSP410 and PHE427 courses.

SOFTWARE

Current
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2018

- **burro¹⁷**
 - R Package for exploring data. Used in multiple courses

Current
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2017

- **flowDashboard¹⁸**
 - Visualization framework in R/Shiny and processing pipeline for CyTOF and high dimensionality flow cytometry data.

Current
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2017

- **DSIExplore¹⁹**
 - LearnR interactive tutorial explaining the basic behind exploratory data analysis for categorial and continuous data
 - Authored with Jessica Minnier

2019

- **decampr**
 - R Package for editing interactive lessons using the course-R-starter framework by Ines Montani
 - Written with Jessica Minnier

2014

- **surrogateMutation²⁰**
 - R Package for mapping mutations and copy number alterations to networks and associated statistics.
[http://dx.doi.org/10.5281/zenodo.17303²¹](http://dx.doi.org/10.5281/zenodo.17303)

2011

- **ExonModelStrain²²**
 - R Package for detecting alternative exon usage in the Affymetrix Exon Array.

2004

- **Consense-Cluster²³**
 - R Package for comparing multiple clustering methods

RESEARCH

● Research Statement

My research interests are complex diseases, precision medicine, applications of systems science (including network analysis and modeling), and applying data integration to difficult and high-impact translational research questions. These questions include immune system profiling in both infectious disease (tuberculosis) and Acute Myeloid Leukemia, understanding drug sensitivity in the context of multiple cancer types (AML, Colorectal, Breast and Head and Neck Cancer), and quantifying expression differences in alcoholic preference. I have worked with a large number of datatypes (high-throughput immunophenotyping, proteomics, expression, genomic, and functional drug screen data) and have focused on methods and frameworks integrating these datatypes within the biological and clinical context of these translational research questions.

My training in biomedical informatics as a master's student in Biomedical Informatics, as an NLM Predoctoral Fellow, and as a NLM Postdoctoral fellow has enabled me to communicate with a wide variety of collaborators by giving me a strong background in Cancer Biology, Software Development, and Clinical Systems.

Additionally, I am a strong advocate for Open Science initiatives, most notably the effort for reproducibility in scientific analysis. To this end, I have developed multiple novel software pipelines that transparently process data from raw data to through the final stages of analysis.

SELECTED PUBLICATIONS, POSTERS, AND TALKS

2020

● Reversible suppression of T cell function in the bone marrow microenvironment of acute myeloid leukemia²⁴

PNAS <https://doi.org/10.1073/pnas.1916206117>

• Adam J Lamble, Yoko Kosaka, **Ted Laderas**, Allie Maffit, Andy Kaempf, Lauren K Brady, Weiwei Wang, Nicola Long, Jennifer N Saultz, Motomi Mori, David Soong, Clare V LeFave, Fei Huang, Homer Adams, Marc M Loriaux, Cristina E Tognon, Pierrette Lo, Jeffrey W Tyner, Guang Fan, Shannon K McWeeney, Brian J Druker, Evan F Lind

2019

● Illuminating Biological Pathways for Drug Targeting in Head and Neck Squamous Cell Carcinoma²⁵

PLOS One <https://doi.org/10.1371/journal.pone.0223639>

• Gabrielle Choonoo, Aurora S. Blucher, Samuel Higgins, Mitzi Boardman, Sophia Jeng, Christina Zheng, James Jacobs, Ashley Anderson, Steven Chamberlin, Nathaniel Evans, Myles Vigoda, Benjamin Cordier, Jeffrey W. Tyner, Molly Kulesz-Martin, Shannon K. McWeeney, and **Ted Laderas**.
• Senior Author. Did code review of entire workflow and published the workflow as an RMarkdown Notebook at mybinder.org

- 2019 ● **CSF1R inhibitors exhibit anti-tumor activity in acute myeloid leukemia by blocking paracrine signals from support cells²⁶**
Blood <https://doi.org/10.1182/blood-2018-03-838946>
• David K Edwards, Kevin Watanabe-Smith, Angela Rofelty, Alisa Dammersawad, **Ted Laderas**, Adam Lamble, Evan F Lind, Andy Kaempf, Motomi Mori, Mara Rosenberg, Amanda d'Almeida, Nicola Long, Anupriya Agarwal, David Tyler Sweeney, Marc Loriaux, Shannon K McWeeney, Jeffrey W Tyner.
- 2019 ● **Immune checkpoint inhibitors reverse T-cell functional suppression in the bone marrow of a subset of AML patients**
The Journal of Immunology
• Evan F Lind, Adam J Lamble, Yoko Kosaka, **Ted Laderas**, Lauren Brady, Fei Huang, Brian J Druker, Jeffrey W Tyner, Shannon McWeeney
- 2019 ● **Conversations about Sleep: Clinical Data Wrangling**
AMIA Informatics Educators Conference
• **Ted Laderas**, Nicole Weiskopf, and Eilis Boudreau. Talk given for American Medical Informatics Association's Informatics Educator's Conference
- 2019 ● **Clinical Data Wrangling: Active/Didactic Learning.**
Symposium on Data Science and Statistics
• **Ted Laderas**, Nicole Weiskopf, and Eilis Boudreau. Talk given for Symposium on Data Science and Statistics.
- 2019 ● **Data Scavenger Hunts: Learning about datasets together**
CSV Conference
• Talk given for CSV Conference
- 2019 ● **Teaching Bioinformatics Students about Clinical Data**
OSU Center for Genome Research and Computing Spring Conference
• Invited talk.
- 2019 ● **Democratizing Data Science Using LearnR and Shiny²⁷**
RStudio Conference
• Poster on interactive visualization and pedagogy.
• Written with Jessica Minnier
- 2018 ● **Immunogenomic Exploration of the Acute Myeloid Leukemia Microenvironment Identifies Determinants of T-Cell Fitness.²⁸**
Blood <https://doi.org/10.1182/blood-2018-99-118424>
• Lauren K Brady, David Soong, Evan F Lind, Yoko Kosaka, Adam J Lamble, Michael Schaffer, Brendan P Hodgkinson, Clare Lefave, **Ted Laderas**, Shannon K McWeeney, Homer Adams, Yann Abraham, Pegah Safabakhsh, Jeffrey W Tyner, Brian J Druker, Fei Huang.

- 2018
- **Integrated functional and mass spectrometry-based flow cytometric phenotyping to describe the immune microenvironment in acute myeloid leukemia²⁹**
Journal of immunological methods
<https://doi.org/10.1016/j.jim.2017.11.010>
- 2018
- **How are Data Science and Systems Science Connected?³⁰**
Systems Science Program, Portland State University
 - Talk given about the relationship between machine learning and systems science
- 2017
- **Training future biocurators through data science trainings and open educational resources.**
F1000 Research
 - Nicole Vasilevsky, **Ted Laderas**, Jackie Wirz, Bjorn Pederson, David A Dorr, William Hersh, Shannon McWeeney, Melissa Haendel.
- 2017
- **Teaching data science fundamentals through realistic synthetic clinical cardiovascular data³¹**
Biorkv
 - **Ted Laderas**, Nicole Vasilevsky, Bjorn Pederson, Shannon McWeeney, Melissa Haendel, and David Dorr.
 - Contribution: First author: helped conceive study, designed bayesian network, developed course material based on dataset.
- 2017
- **Data Science for Basic Scientists³²**
OHSU Symposium on Educational Excellence
 - Invited talk.
- 2016
- **Comprehensive characterization of VISTA expression in patients with acute myeloid leukemia³³**
Journal of Clinical Oncology
https://doi.org/10.1200/JCO.2016.34.15_suppl.e14546
 - Adam Lamble, Yoko Kosaka, Fei Huang, Kate Sasser, Cristina Tognon, **Ted Laderas**, Shannon McWeeney, Marc Loriaux, Brian J Druker, Jeffrey Tyner, Evan Lind
- 2015
- **The Consensus Molecular Subtypes of Colorectal Cancer.**
Nature Medicine
 - Justin Guinney, Rodrigo Dienstmann, Xin Wang, Aurélien de Reyniès, Andreas Schlicker, Charlotte Soneson, Laetitia Marisa, Paul Roepman, Gift Nyamundanda, Paolo Angelino, Brian M. Bot, Jeffrey S. Morris, Iris Simon, Sarah Gerster, Evelyn Fessler, Felipe de Sousa e Melo, Edoardo Missiaglia, Hena Ramay, David Barras, Krisztian Homicsko, Dipen Maru, Ganiraju C. Manyam, Bradley Broom, Valerie Boige, **Ted Laderas**, Ramon Salazar, Joe W. Gray, Douglas Hanahan, Josep Tabernero, Rene Bernards, Stephen H. Friend, Pierre Laurent-Puig, Jan P. Medema, Anguraj Sadanandam, Lodewyk Wessels, Mauro Delorenzi, Scott Kopetz, Louis Vermeulen, and Sabine Tejpar.
 - Contribution: mapped and analyzed OMICs data to consensus cancer subtypes.

- 2015 ● **Between Pathways and Networks lies Context.**
Science Progress
· Ted Laderas, Guanming Wu, and Shannon McWeeney.
- 2015 ● **A network-based model of oncogenic collaboration for prediction of drug sensitivity³⁴**
Frontiers in Genetics <https://dx.doi.org/10.3389%2Ffgene.2015.00341>
· Ted G Laderas, Laura M Heiser, Kemal Sönmez
- 2011 ● **Computational detection of alternative exon usage³⁵**
Frontiers in Neuroscience <https://doi.org/10.3389/fnins.2011.00069>
· Ted G Laderas, Nicole AR Walter, Michael Mooney, Kristina Vartanian, Priscila Darakjian, Kari Buck, Christina A Harrington, John Belknap, Robert Hitzemann, Shannon K McWeeney
- 2009 ● **High throughput sequencing in mice: a platform comparison identifies a preponderance of cryptic SNPs³⁶**
BMC genomics <https://doi.org/10.1186/1471-2164-10-379>
· Nicole AR Walter, Daniel Bottomly, **Ted Laderas**, Michael A Mooney, Priscila Darakjian, Robert P Searles, Christina A Harrington, Shannon K McWeeney, Robert Hitzemann, Kari J Buck
- 2007 ● **Consensus framework for exploring microarray data using multiple clustering methods.**
OMICS
· Ted Laderas and Shannon McWeeney
- 2007 ● **TandTRAQ: an open-source tool for integrated protein identification and quantitation³⁷**
Bioinformatics <https://doi.org/10.1093/bioinformatics/btm467>
· **Ted Laderas**, Cory Bystrom, Debra McMillen, Guang Fan, Shannon McWeeney

↗ SELECTED DATA SCIENCE WRITING

- 2020 ● **Rebuilding the RBootcamp and Generating R Tutorials³⁹**
RStudio Education Blog
· Story about building our interactive RBootcamp using Ines Montani's interactive R/Python Framework.
· Written with Florencia D'Andrea and Jessica Minnier
- 2019 ● **RStudioConf 2019: Education and Organizations⁴⁰**
Personal Blog
· Story about presenting our poster about interactive data science education and educational resources/talks at RStudioConf 2019

I regularly blog about education, data science, and mental health in a variety of places, but especially at my blog³⁸

- | | |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2019 | <ul style="list-style-type: none">● My Experience with RStudio Instructor Training⁴¹
RStudio Education Blog<ul style="list-style-type: none">• Story about becoming an RStudio Certified Instructor in the Tidyverse and Shiny |
| 2019 | <ul style="list-style-type: none">● Package Building: How DESCRIPTION, NAMESPACE, roxygen, and devtools::document work together⁴²
Personal Blog<ul style="list-style-type: none">• My notes on the bits about package building in R that are a little hard to understand. |
| 2018 | <ul style="list-style-type: none">● What we learned teaching Python to Neuroscience Students⁴³
Personal Blog<ul style="list-style-type: none">• Notes on organizing an intro Python course for Neuroscience Students |
| 2018 | <ul style="list-style-type: none">● Things we learned teaching clinical data wrangling⁴⁴<ul style="list-style-type: none">• My notes on teaching the clinical data wrangling short course, and intro course introducing students to the critical thinking data process with the Sleep Heart Health Study dataset |
| 2018 | <ul style="list-style-type: none">● So You've Accidentally Checked a Large File Into Git⁴⁵
Personal Blog<ul style="list-style-type: none">• Notes on fixing your Git history using the BFG |
| 2017 | <ul style="list-style-type: none">● Some Lessons we Learned Running Cascadia R⁴⁶
Personal Blog<ul style="list-style-type: none">• Notes on organizing and running the first NW regional R Conference, Cascadia R |

SERVICE

● Service Statement

I am a strong supporter of service at OHSU and beyond. I currently participate in the DMICE BCB (Bioinformatics and Computational Biology) Faculty Division meeting, the DMICE Mentoring committee, and have participated in the BCB Curriculum Retreat in order to plan upcoming coursework at DMICE. As a Pacific Islander, I have a unique viewpoint about diversity and have dedicated myself to making classes and workshops psychologically safe.

Beyond OHSU, I believe that we need to increase public engagement of science and increase outreach and mentoring of next-generation science students, especially from disadvantaged populations will enable these students to succeed in STEM-based careers.

As a former student of Saturday Academy's scientific mentoring program, I want to contribute back to this community and engage potential STEM students through student outreach and mentoring. I am also involved in outreach through the development of course material for the Biocatalyst training program through Oregon Bioscience Association, which provides bioscience training for unemployed or under-employed professionals.

SERVICE HISTORY AND ACCOMPLISHMENTS

Current
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2015

● BioData Club⁴⁷

Oregon Health & Science University

- Co-founder. Data Science focused community of practice. We are students, postdocs, staff, and faculty focused on learning Data Science skills together
- Currently at 329 members spanning OHSU, PSU and beyond

Current
|
2019

● Portland R User Group⁴⁸

- Co-organizer.

Current
|
2017

● DMICE Assessment and Planning Committee

Current
|
2017

● DMICE BCB Division Committee

Current
|
2017

● Biomedical Informatics Curriculum Committee

Current
|
2017

● DMICE BCB Admissions Committee

Oregon Health & Science University

- Current | 2019
- **OHSU Computational Forum**
 - Co-organizer
- 2019
- **Engaging Students in Statistics & Data Science**
Symposium on Data Science and Statistics
 - Session Chair.
- 2019
- **Software Carpentry**
 - Contributor to instructor training materials.
- 2018 | 2017
- **Cascadia-R Conference⁴⁹**
Oregon Health & Science University
 - Co-founder. Regional Conference focused on sharing skills and projects using the R Statistical language. Responsible for logistics, talk selection, and scholarship selection
 - 254 Attendees in 2018.

SELECTED PRESS (ABOUT)

SELECTED PRESS (BY)

POSITIONS AND WORK EXPERIENCE

- Current | 2017
- **Assistant Professor, Division of Bioinformatics and Computational Biomedicine**
Medical Informatics and Clinical Epidemiology, Oregon Health & Science University  Portland, OR
- 2017 | 2015
- **Postdoctoral Researcher, OHSU Knight Cancer Institute**
Oregon Health & Science University  Portland, OR
- 2015 | 2014
- **NLM Postdoctoral Fellow, Division of Bioinformatics and Computational Biology**
Medical Informatics and Clinical Epidemiology, Oregon Health & Science University  Portland, OR
- 2015 | 2014
- **Visiting Scientist**
Sage Bionetworks  Seattle, WA

- 2014
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2009
- **NLM Predoctoral Fellow, Division of Bioinformatics and Computational Biology**
Medical Informatics and Clinical Epidemiology, Oregon Health & Science University
- 2009
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2003
- **Bioinformatics Developer/Project Manager, OHSU Knight Cancer Institute**
Oregon Health & Science University 📍 Portland, OR
- 2002
|
2001
- **Teaching Assistant/Computer Programmer/Server Admin, Medical Informatics and Clinical Epidemiology**
Oregon Health & Science University 📍 Portland, OR
- 2001
|
1999
- **Research Assistant/Computer Programmer, Department of Molecular Medicine**
Oregon Health & Science University 📍 Portland, OR
 - Developed and extended real time image processing pipeline using LabView. Conducted surface tension experiments using lung surfactant components
- 1998
|
1996
- **Research Assistant/Teaching Assistant**
Gerrity Lab 📍 Reed College
 - TA in Instrumentation Lab
 - Conducted research using resonance raman spectroscopy/
 - Programmed in LabView/Igor

🔗 LINKS

- 1: <https://scholararchive.ohsu.edu/concern/etds/kk91fk708?locale=en>
- 2: <https://scholararchive.ohsu.edu/concern/etds/76537133j?locale=en>
- 3: <https://laderast.github.io/AnalyticsCourse>
- 4: <https://ready4r.netlify.app>
- 5: <https://stats4neuro.netlify.app>
- 6: <https://laderast.github.io/PHE427/>
- 7: https://github.com/dasaderi/python_neurobootcamp
- 8: <https://r-bootcamp.netlify.app>
- 9: https://laderast.github.io/clinical_data_wrangling
- 10: <http://laderast.github.io/igraphTutorial/>
- 11: https://laderast.github.io/gradual_shiny
- 12: https://laderast.github.io/nhanes_explore
- 13: https://biodata-club.github.io/talks/repro_paper.pdf
- 14: https://laderast.github.io/data_storytelling_bdc/#1
- 15: <https://github.com/laderast/cvdRiskData>
- 16: <https://tladeras.shinyapps.io/dataLiteracyTutorial/>
- 17: <https://laderast.github.io/burro>
- 18: <https://github.com/laderast/flowDashboard>
- 19: <https://github.com/laderast/DSIExplore>
- 20: <https://github.com/laderast/surrogateMutation>
- 21: <http://dx.doi.org/10.5281/zenodo.17303>
- 22: <https://github.com/laderast/ExonModelStrain>

23: <https://github.com/laderast/consense>
24: <https://doi.org/10.1073/pnas.1916206117>
25: <https://doi.org/10.1371/journal.pone.0223639>
26: <https://doi.org/10.1182/blood-2018-03-838946>
27: http://bit.ly/equal_vis
28: <https://doi.org/10.1182/blood-2018-99-118424>
29: <https://doi.org/10.1016/j.jim.2017.11.010>
30: https://laderast.github.io/sysc_data_sci/
31: <https://www.biorxiv.org/content/early/2017/12/12/232611>
32: <http://laderast.github.io/DS4BS/>
33: https://doi.org/10.1200/JCO.2016.34.15_suppl.e14546
34: <https://dx.doi.org/10.3389%2Ffgene.2015.00341>
35: <https://doi.org/10.3389/fnins.2011.00069>
36: <https://doi.org/10.1186/1471-2164-10-379>
37: <https://doi.org/10.1093/bioinformatics/btm467>
38: <https://laderast.github.io/blog/>
39: <https://education.rstudio.com/blog/2020/03/r-bootcamp/>
40: <http://laderast.github.io/2019/01/24/rstudio-conf-2019-education-and-organizations/>
41: <https://education.rstudio.com/blog/2019/11/my-experience-with-rstudio-instructor-training/>
42: <http://laderast.github.io/2019/02/12/package-building-description-namespace/>
43: <http://laderast.github.io/2018/01/17/what-we-learned-teaching-python-to-neuroscience-students/>
44: <http://laderast.github.io/2018/10/15/clinical-data-wrangling/>
45: <http://laderast.github.io/2018/01/05/so-you've-accidentally-checked-in-a-large-file-into-git/>
46: <http://laderast.github.io/2017/06/07/cascadiarnotes/>
47: <https://biodata-club.github.io>
48: <https://pdxrlang.org>
49: <https://cascadiarconf.com/>