Jayaram Kancherla

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Instituition and Affiliation

Current Appointments

Faculty Specialist
Center for Bioinformatics and Computational Biology (CBCB)
University of Maryland Advanced Computer Studies (UMIACS)

Address

Brendan Iribe Center for Computer Science
Rm #3224
8125 Paint Branch Drive
College Park, Maryland 20745

Education

- Masters in Computer Science *Aug 2009 - May 2011*
  North Carolina State University, Raleigh
- Bachelors in Computer Science and Engineering *Oct 2005 - Apr 2009*
  V.R. Siddhartha Engineering College
  Affiliated to Nagarjuna University, India

MOOC Courses

- Introduction to Big Data with Apache Spark - edX *Jul 2015*
- Scalable Machine Learning - edX *Aug 2015*

Conferences, Workshops, and Talks

Publications

1. **[Under Review, Preprint] Jayaram Kancherla**, Yifan Yang, Hyeyun Chae, Héctor Corrada Bravoo. Epiviz File Server: Query, Transform and Interactively Explore Data from Indexed Genomic Files. *bioRxiv* 865295; doi: 10.1101/865295

2. **[Submitted, Preprint]** Justin Wagner, Jayaram Kancherla, Domenick Braccia, James Matsumura, Victor Felix, Jonathan Crabtree, Anup Mahurkar, Héctor Corrada Bravo. Interactive Exploratory Data Analysis of Human Microbiome Project Phase II Data Using Metaviz.

3. **[Submitted, Preprint]** Mohamed K. Gunady, **Jayaram Kancherla**, Héctor Corrada Bravo, Soheil Feizi. scGAIN: Single Cell RNA-seq Data Imputation using Generative Adversarial Networks. *bioRxiv* 837302; doi: 10.1101/837302

4. **[Preprint]** Bakken, Trygve E., et al. Evolution of cellular diversity in primary motor cortex of human, marmoset monkey, and mouse. *bioRxiv* 2020.03.31.016972; doi: 10.1101/2020.03.31.016972

5. **[Preprint]** Zizhen Yao., et al. An integrated transcriptomic and epigenomic atlas of mouse primary motor cortex cell types. 2020.02.29.970558; doi: 10.1101/2020.02.29.970558

6. **(*equal contribution) Jayaram Kancherla***, Shruti Rao*, Krithika Bhuvaneshwar, Rebecca B. Riggins, Robert A. Beckman, Subha Madhavan, Héctor Corrada Bravo, Simina M. Boca. An evidence-based network approach to recommending targeted cancer therapies. JCO Clinical Cancer Informatics no. 4 (2020) 71-88; doi: 10.1200/CCI.19.00097

7. Z. Cui, **J. Kancherla**, H. C. Bravo and N. Elmqvist, Sherpa: Leveraging User Attention for Computational Steering in Visual Analytics. 2019 IEEE Visualization in Data Science (VDS), Vancouver, BC, Canada, 2019, pp. 48-57. doi: 10.1109/VDS48975.2019.8973384

8. **(*equal contribution)** Zhe Cui*, **Jayaram Kancherla***, Kyle W Chang, Niklas Elmqvist, Héctor Corrada Bravo, Proactive visual and statistical analysis of genomic data in Epiviz, *Bioinformatics*, btz883, doi: 10.1093/bioinformatics/btz883

9. Nathan D Olson, Nidhi Shah, **Jayaram Kancherla**, Justin Wagner, Joseph N Paulson, Héctor Corrada Bravo. metagenomeFeatures: an R package for working with 16S rRNA reference databases and marker-gene survey feature data, *Bioinformatics*, btz136, doi: 10.1093/bioinformatics/btz136

10. **Kancherla J**, Zhang A, Gottfried B and Bravo HC. Epiviz Web Components: reusable and extensible component library to visualize functional genomic datasets. *F1000Research* 2018, 7:1096; doi: 10.12688/f1000research.15433.1

11. **(*equal contribution)** Justin Wagner*, Florin Chelaru*, **Jayaram Kancherla***, Joseph N Paulson*, Alexander Zhang, Victor Felix, Anup Mahurkar, Niklas Elmqvist, Héctor Corrada Bravo; Metaviz: interactive statistical and visual analysis of metagenomic data, *Nucleic Acids Research*, Volume 46, Issue 6, 6 April 2018, Pages 2777–2787, doi: 10.1093/nar/gky136

12. Gary Ginsberg, Suryanarayana V Vulimiri, Yu-Sheng Lin, **Jayaram Kancherla**, Brenda Foos & Babasaheb Sonawane (2017) A framework and case studies for evaluation of enzyme ontogeny in children's health risk evaluation, *Journal of Toxicology and Environmental Health*, Part A, 80:10-12, 569-593, doi: 10.1080/15287394.2017.1369915

13. Mansouri, Kamel et al. Collaborative Estrogen Receptor Prediction Project for EDSP Prioritization. *Environmental Health Perspectives* (2016); doi: 10.1289/ehp.1510267

14. Richard M.A. et al. The ToxCast Chemical Landscape: Paving the Road to 21st Century Toxicology. *Chemical Research in Toxicology* (2016) doi: 10.1021/acs.chemrestox.6b00135

Book Chapter

- Kanchana Padmanabhan, Brent Harrison, Kevin Wilson, Michael L. Warren, Jayaram Kancherla, Katie Bright, Justin Mosiman, Hieu Phung, Benjamin Miller, and Sam Shamseldin, 2013. *Cluster Analysis*, *Practical Graph Mining with R*, CRC Press. ISBN: 9781439860847

Selected Presentations & Posters

1. Quickly compose custom interactive genomic visualization apps in R/Bioc with epiviz components. BioC 2020, July 29 - 31, 2020. (Presentation)
2. Epiviz File Server – Query, Compute and Interactive Exploration of data from Indexed Genomic Files, BOSC, *International Society for Molecular Biology* (ISMB/ECCB), July 21-25, 2019, Basel, Switzerland (Presentation & Poster) 10.7490/f1000research.1117422.1
3. Proactive Visual and Statistical Analysis of Genomic Data in Epiviz, BioVis, *International Society for Molecular Biology* (ISMB/ECCB 2019), July 21-25, 2019, Basel, Switzerland (Presentation & Poster) 10.7490/f1000research.1117423.1
4. Jayaram Kancherla, Bob Sonawane, Bruce Fowler. Determination of Permissible Daily Exposures in Human Drug Products for Elemental Impurities via the Transdermal Delivery Route. *Society of Toxicology* 2019, March 10-14, Baltimore, MD (Presentation) link
5. B.R. Sonawane, G. Ginsberg, and J. Kancherla, 2018. Role on Enzyme Ontogeny in Evaluation of Aceteminophen Metabolism and Hepatotoxicity in Children. *Society of Toxicology* 2018. March 11-15, San Antonio, TX (Presentation)
6. Kancherla J., Mansouri K., Truong H., Richard A.M., Judson R., 2014. ACToR Chemical Structure processing using Open Source Cheminformatics Libraries. *Society of Toxicology, Future Tox II National Meeting.* January 16-17, Chapel Hill, NC. (Poster) 10.23645/epacomptox.5197126
7. Vulimiri S.V., Kancherla J., Lin YS., Ginsberg G., Foos B., Sonawane B., 2014. Scoping the need for PBPK modeling of Child-Adult Metabolism Differences: Case Studies Applying an Enzyme Ontogeny Database. *Society of Toxicology 53rd Annual Meeting.* March 23-27, Phoenix, AZ. (Poster)

Accepted Bioconductor Packages

- Kancherla J, Gottfried B, Corrada Bravo H. epivizrChart: R interface to epiviz web components. R package. doi: 10.18129/B9.bioc.epivizrChart
- Bravo HC, Chelaru F, Smith L, Goldstein N, Kancherla J, Walter M, Gottfried B. epivizr: R Interface to epiviz web app. R package. doi: 10.18129/B9.bioc.epivizr
- Kancherla J, Bravo HC. epivizrStandalone: Run Epiviz Interactive Genomic Data Visualization App within R. R package. doi: 10.18129/B9.bioc.epivizrStandalone
- Corrada Bravo H, Chelaru F, Wagner J, Kancherla J, Paulson J. metavizr: R Interface to the metaviz web app for interactive metagenomics data analysis and visualization. R package. doi: 10.18129/B9.bioc.epivizrChart

Workshops

- Interactive visualization and data analysis with Epiviz web-components (Differential Gene Expression analysis using minfi) *Jul 27-28, 2017*
  Jayaram Kancherla, Héctor Corrada Bravo, Brian Gottfried
  BioC 2017, Dana Farber Cancer Institute, Boston, MA
- Metaviz Interactive Statistical and Visual Analysis using data from Human Microbiome Project *Jun 2017*
  Justin Wagner, Jayaram Kancherla, Héctor Corrada Bravo
  University of Maryland Institute of Genomic Science, Baltimore, MD
- Interactive visualization of microbiome data using Metaviz *Nov 1-2, 2016*
  Jayaram Kancherla, Héctor Corrada Bravo
  Mid Atlantic Microbiome Conference, College Park, MD

- Interactive visualization with epiviz *Jun 25-26, 2016*
  Héctor Corrada Bravo, Jayaram Kancherla, Justin Wagner, Deok Park
  BioC 2016, Stanford University, Stanford, CA
- Interactive Genomic Data Analysis and Visualization using Epiviz *Jun 15, 2016*
  Jayaram Kancherla
  International Society for Computational Biology, DC RSG

Research Grants, Fellowships & Awards

Fellowships

- Oakridge Science Research Fellowship (ORISE)
  National Center for Computational Toxicology (NCCT)
  U.S. Environmental Protection Agency
  Research Triangle Park, Durham, NC
  Fellowship #EPA-ORD/NCCT-2012-19 *Aug 2013 - Dec 2015*
  Title: Design and Development of Computational Decision Support Systems
  The overall goal of the project is to integrate High Throughput Screening (HTS) data from the ToxCast project & the Tox21 initiative with other EPA data sources and, build interactive tools and applications to visualize HTS data and for characterizing risk assessment and prioritization of chemicals.
- Student Research Trainee
  National Center for Environmental Assessment (NCEA)
  U.S. Environmental Protection Agency
  Crystal City, Arlington, VA
  Fellowship #EP-11-H-001649 *Sep 2011 - Aug 2013*
  Title: Sustainable Community Assessment platform
  I worked with the US Census & sustainable communities to create a platform to share environmental data. Identified use cases and created an ideation platform to engage stakeholders and communities to make sustainable decisions. Developed tools to visualize data shared through the platform.
  Enzyme Ontogeny: Text mining to collect metabolism & enzyme ontogeny data from published literature. Visualize time series data for enzyme expression across different life stages.

Honors & Awards

- Level III EPA Scientific and Technological Achievement Award *2019*
- Travel Fellowship, ISMB/ECCB 2019 *Jul 2019*
- Travel Fellowship, Society of Toxicology (SOT), Future Tox II *Jan 2014*
- STARS (Students & Technology in Academia, Research and Service) *Feb 2011*
  Student Volunteer Award, North Carolina State University

Service & Outreach

Reviewer

- Journal of Open Source Software (JOSS)
- American Medical Informatics Association (AMIA) 2020 Informatics Summit
- RECOMB CCB 2019

- ACM-BCB 2016

Research Experience

Positions

- Faculty Specialist (with *Dr. Hector Corrada Bravo*) *Sep 2019 - Present*
  Faculty Research Assistant *Jan 2016 - Sep 2019*
  University of Maryland, College Park, MD

  My research focuses on development of tools and methods for interactive statistical exploration and visualization of large scale genomic datasets. I primarily work as on the development of the Epiviz (http://www.epiviz.org) suite of tools .

- Oakridge Science Research Fellow (with *Dr. Richard Judson*) *Aug 2013 - Dec 2015*

  National Center for Computational Toxicology (NCCT)
  U.S. Environmental Protection Agency, Durham, NC

  Dashboard systems are developed to interactively explore and visualize High Throughput Screening (HTS) data from the ToxCast program (1800 chemicals tested in 700 assays). I designed and developed the framework for building interactive dashboards, and was also responsible for managing and integrating the HTS data with existing EPA datasets (ExpoCast, PhysChem, ToxRef etc) for building QSAR models and analysis. I worked on the following publicly available dashboards

  - EPA ToxCast Dashboard (http://actor.epa.gov/dashboard)
  - Endocrine Disruptor Screening Program (http://actor.epa.gov/edsp21/)
  - ACToR (http://actor.epa.gov)

- Student Research Trainee *Sep 2011 - Aug 2013*
  National Center for Environmental Assessment (NCEA)
  U.S. Environmental Protection Agency, Arlington, VA

  Sustainable Community Assessment Platform (Mentor: *Rick Ziegler*)
  I worked with the US Census & sustainable communities to create a platform to share environmental data. Identified use cases and created an ideation platform to engage stakeholders and communities to make sustainable decisions. Developed tools to visualize data shared through the platform.

  Enzyme Ontogeny (Mentors: *Dr. Bob Sonawane & Dr. Suryanarayana Vulimiri*)
  Text mining to collect metabolism & enzyme ontogeny data from published literature. Visualize time series data for enzyme expression across different life stages.

Research Software and Applications

(Complete list available on GitHub [id: jkanche])

- Epiviz File Server: Query and Transform directly from indexed genomic files
  GitHub: https://github.com/epiviz/epivizFileParser
  Published to PyPI: https://pypi.org/project/epivizFileServer
  doi: 10.5281/zenodo.3841643
- Epiviz Feed: Proactive interactive and statistical visualization of genomic data
  The Epiviz Feed application for the cancer epigenetics use case is hosted on an AWS instance and is available at http://54.157.53.251/browser
  User Interface: https://github.com/epiviz/epiviz_feed_polymer
  Computational Server: https://github.com/epiviz/epiviz-feed-computation
  doi: 10.5281/zenodo.3373762

- CDGnet: Network visualization for precision medicine
  The CDGnet tool is hosted at http://epiviz.cbcb.umd.edu/shiny/CDGnet
  https://github.com/jkanche/nfpmShinyComponent
- Epiviz Components: Web Components for interactive visualization of genomic data
  Epiviz Chart - https://github.com/epiviz/epiviz-chart
  R package - Epivizr - https://github.com/epiviz/epivizrChart
- Interactive visualization of metagenomic data
  Metaviz - https://github.com/epiviz/metaviz
  R package - Metavizr - https://github.com/epiviz/metavizr
- Interactive visualization of functional genomics data
  Epiviz - https://github.com/epiviz/epiviz
  R package - Epivizr - https://github.com/epiviz/epivizr
- EPA ToxCast Dashboard - http://actor.epa.gov/dashboard
- EPA Endocrine Disruptor Screening Program - http://actor.epa.gov/edsp21/

Skills

Programming	-	JavaScript, Python, R, Go
Data Management	-	MySQL, Neo4j
Frameworks	-	Polymer, Flask, Sanic, d3Js
Chemo Informatics	-	RDKIT, Indigo, KNIME

Work Experience

- Web Developer *Oct 2010 - May 2011*
  North Carolina State University, NC
- STARS Website Developer (Volunteer) *Aug 2010 - Mar 2011*
  STARS Student Leadership Corps (SLC)
  North Carolina State University, NC
- Transcriber *Nov 2009 - Apr 2010*
  University Disability Services,
  North Carolina State University, NC

Teaching & Mentoring

Guest Lectures

- Next Generation Toxicology and Computational Toxicology Databases *Apr 30, 2019*
  EMAP 514 – Introduction to Environmental Health Risk Assessment & Management
  Environmental Metrology and Policy Program
  Georgetown University, Washington DC

Co-supervised Students

Undergraduate (at UMD)

- Lan Tran, CS, *Graduated 2016*
- Alexander Zhang, CS, *Graduated 2018*

- Brian Gottfried, CS, *Graduated 2018*
- Hyeyun Chae, Intern, *Summer 2019*
- Yifan Yang, CS, *Current*
- Kyle Chang, CS, *Current*

Mentoring Activities

- CSC 116 Tutor *Aug 2010 - Mar 2011*
  North Carolina State University, NC
- Mentor for STARS Student Leadership Corps (SLC) *Aug 2010 - Mar 2011*
  STARS Student Leadership Corps (SLC)
  North Carolina State University, NC