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Oliver Bonham-Carter

Curriculum Vitæ Updated: March 24, 2023

Research Interests: *To apply my academic efforts to produce better mechanisms of data analysis in bioinformatics. To inspire my students to follow their dreams to successful careers in data analysis.*

Current Appointment

2017 - current **Assistant Professor, Dept of Computer Information Science, Dept of Informatics**, *Allegheny College*, Meadville, PA.
Department of Computer Science

Classes Taught

Data Analytics, *Exploratory steps in analysis, plotting, statistics, models, text analysis*, CSMPSC301.

Data bases, *SQL, MongoDB, Neo4J; database design, query, modification,and maintenance*, CMPSC312.

Bioinformatics, *Genetic sequences, genes structure, protein folding, alignment, analysis*, CMPSC300.

Operating Systems, *Kernals, memory pages, CPU and software*, CMPSC400.

Junior Seminar, *Research project proposal preparation for senior comp*, CMPSC580.

Senior comps, *Senior student advisor for comp project*, CMPSC600 and CMPSC610.

Academic Discord, *First Year students: Data usage, comprehension and basic analysis*, FS101.

Theory of Computation CMPSC, *Turing Machines, automata, symbols, languages, programmable machines*.

OutReach, *Teaching Data Analytics to high-school students*.

Prior Appointments

2016 **Visiting Assistant Professor**, *Allegheny College*, Meadville, PA.
Department of Computer Science

2014 Fall - 2016 **Management of Information Systems - Teaching**, *UNO*, Omaha, Nebraska.
CIST 2100: Organizations, Applications and Technology

2009 – 2016 **Bioinformatics - Research**, *Peter Kiewit Inst - UNO*, Omaha, Nebraska.
Post-translational modifications, protein interactions as a result of environmental stress, DNA gene prediction/detection using non-alignment, mathematically and statistically based ideas and methods

Summers: 2007, 08, 09, 10 **Teaching and Counseling**, *Aim for the Stars Math & Science Summer Camp*, Omaha, Nebraska.
Teaching: Robotics and Logics. Counseling: Zoology

2007 – 2009 **Mathematics - Teaching**, *UNO*, Omaha, Nebraska.
Mathematics Graduate Teaching Assistant; College Algebra and Intermediate Algebra

2006 – 2007 **Mathematics - Teaching and Tutoring**, *UNO*, Omaha, Nebraska.
Teach and tutor mathematics at the study center at South High School

Summer 2006 **Educator**, *Durham Western Heritage Museum*, Omaha, Nebraska.
Educator for the *"Engineer-It!"* attraction. Educator of youth summer camps for bridge & basic structure building, as well as, basic engineering and design. General public relations for visitors of exhibit.

Spring 2006 **Collaborative Research Project**, *UNO/PKI & Omaha Zoo*, Omaha, Nebraska.
Statistical software development for the Omaha Zoo.

Teaching

Selected Publications

March 2021 **Oliver Bonham-Carter and Yee Mon Thu**, *"GenExSt: A Tool to Identify Correlation of Gene Expression after Normalization with Housekeeping Genes."*, Future of Information and Communication Conference. Springer, Cham, 2021, `https://github.com/developmentAC/genExSt`.

April 2020 **Enpu You, Oliver Bonham-Carter and Janyl Jumadinova**, *"Text mining in Python for Evaluating the Ethical Foundations in Computer Science"*, Poster featured at Pycon 2020, Python Software Foundation.
Author details: `https://us.pycon.org/2020/speaker/profile/992/`, poster: `https://us.pycon.org/2020/online/posters/`

May 2020 **Janyl Jumadinova and Oliver Bonham-Carter**, *"Integrating Ethics in Teaching Artificial Intelligence."*, In the Proceedings of the 33rd International Artificial Intelligence Society Conference (poster), 2020. Conference gathering was cancelled due to the pandemic.

March 2020 **Oliver Bonham-Carter**, *"BeagleTM: An adaptable text mining method for relationship discovery in literature."*, Future of Information and Communication Conference. Springer, Cham, 2020, `https://github.com/developmentAC/beagleTM`.

Sept 2019 **Oliver Bonham-Carter and Yee Mon Thu**, *"Systematic Normalization with Multiple Housekeeping Genes for the Discovery of Genetic Dependencies in Cancer."*, CNB-MAC / ACMBCB2019, 2019.

August 2016 **Oliver Bonham-Carter**, *"Patterns and Signals of Biology: An Emphasis On The Role of Post Translational Modifications in Proteomes for Function and Evolutionary Progression."*, Dissertation Thesis. University of Nebraska at Omaha, 2016.

August 2016 **Oliver Bonham-Carter and Dhundy Bastola**, *"PTM Tracker: A system for determining trends of PTM modification sites relative to protein domains."*, The IEEE International Conference on Electro Information Technology (EIT), 2016.

December 2015 **Oliver Bonham-Carter, Ishwor Thapa, Steven From and Dhundy Bastola**, *"A study of bias and increasing organismal complexity from their post-translational modifications and reaction site interplays"*, Briefings in Bioinformatics, 18.1 (2017): 69-84.

Nov 2015 **Oliver Bonham-Carter and Dhundy Bastola**, *"A text mining application for linking functionally stressed-proteins to their post-translational modifications"*, 2015 IEEE International Conference on Bioinformatics and Biomedicine (BIBM), IEEE, 2015.

July 2015 **Michael Camara, Oliver Bonham-Carter and Janyl Jumadinova**, *"A Multi-Agent System with Reinforcement Learning Agents for Biomedical Text Mining"*, Proceedings of the 6th ACM Conference on Bioinformatics, Computational Biology and Health Informatics (ACM-BCB), 2015.

July 2014 **Oliver Bonham-Carter, Jay Petersen and Dhundy Bastola**, *"A Content and Structural Assessment of Oxidative Motifs Across a Diverse Set of Life Forms"*, Computers in biology and medicine 53 (2014): 179-189.

February 2014 **Oliver Bonham-Carter, Ishwor Thapa and Dhundy Bastola**, *"Evidence of post translational modification bias extracted from the tRNA and corresponding amino acid interplay across a set of diverse organisms"*, IProceedings of the 5th ACM Conference on Bioinformatics, Computational Biology, and Health Informatics (ACM-BCB), 2014.

July 2013 **Oliver Bonham-Carter, Jay Pedersen, Lotfollah Najjar and Dhundy Bastola**, *"Modeling the Effects of Microgravity On Oxidation in Mitochondria: A Protein Damage Assessment Across a Diverse Set of Life Forms"*, 2013 IEEE 13th International Conference on Data Mining Workshops (DMBIH). IEEE, 2013.

July 2013 **Oliver Bonham-Carter, Lotfollah Najjar and Dhundy Bastola**, *"Evidence of a Pathway of Reduction in Bacteria: Reduced Quantities of Restriction Sites Impact tRNA Activity in a Trial Set."*, Proceedings of the International Conference on Bioinformatics, Computational Biology and Biomedical Informatics, (ACM), 2013.

July 2013 **Oliver Bonham-Carter, Abhishek Parakh and Dhundy Bastola**, *"sEncrypt: An Encryption Algorithm Inspired from Biological Processes"*, 12th IEEE International Conference on Trust, Security and Privacy in Computing and Communications (TrustCom), IEEE, 2013.

May 2013 **Oliver Bonham-Carter, Joe Steele and Dhundy Bastola**, *"Alignment-free genetic sequence comparisons: a review of recent approaches by word analysis"*, Briefings in Bioinformatics, (2013): bbt052.

Nov 2012 **Oliver Bonham-Carter, Hesham Ali and Dhundy Bastola**, *"A base composition analysis of natural patterns for the preprocessing of metagenome sequences"*, BMC Bioinformatics 14. Suppl 11 (2013): S5.

Nov 2012 **Oliver Bonham-Carter, Hesham Ali and Dhundy Bastola**, *"A meta-genome sequencing and assembly preprocessing algorithm inspired by restriction site base composition"*, 2012 IEEE International Conference on Bioinformatics and Biomedicine Workshops (BIBMW), 2012.

May 2012 **Oliver Bonham-Carter, Lotfollah Najjar, Ishwor Thapa and Dhundy Bastola**, *"Distributions of palindromic proportional content in bacteria"*, 8th International Symposium on Bioinformatics Research and Applications (ISBRA), 2012.

May 2001 **Bruce M. Boman, Jeremy Z. Fields, Oliver Bonham-Carter and Olaf A. Runquist**, *"Computer modeling implicates stem cell overproduction in colon cancer initiation"*, Cancer research, 2001.

Selected Projects

GitHub Projects Portfolio, *Web:* `https://github.com/obonhamcarter`, An assortment of projects.

GradeAlert, *A tool to help with reporting grades from CSV files for GitHub Classroom courses.*, GitHub clone link: git@github.com:developmentAC/gradeAlert.git, Web: `https://github.com/developmentAC/gradeAlert`.

Morse-Encode-Decoder, *A learning tool to convert text to Morse code and Morse code to text.*, GitHub clone link: git@github.com:developmentAC/Morse-Encode-Decoder.git, Web: `https://github.com/developmentAC/Morse-Encode-Decoder`.

GenExSt, *A an method and tool to analyze normalized gene expression for cancer research. Topics keywords: Gene expression, normalization, cancer, GeneExSt*, GitHub clone link: git@github.com:developmentAC/beagleTM.git, Web: `https://github.com/developmentAC/genExSt`.

BeagleTM, *A text mining tool for developing visual and interactive relationship networks from PubMed article information. Topics keywords: PubMed, parsing, textmining, literature-review-tool, Beagletm, analysis*, GitHub clone link: git@github.com:developmentAC/beagleTM.git, Web: `https://github.com/developmentAC/beagleTM`.

GatorShot, *Web toy to superimpose the faculty photos from the Department of Computer Science at Allegheny College with your own live selfie. Topics include: webtoy, javascript, selfie, alleghenycollege*, GitHub clone link: git@github.com:obonhamcarter/gatorShot.git, Web: `https://github.com/obonhamcarter/gatorShot`.

Selected Classes Taught

Academic Discource I, *A class for success for incoming and first-year students.*

Data Analytics for `https://scholarly.co/`, *An online class about for the isolation and analysis of statistically-discovered trends and patterns from data sets. Includes material of ethics and responsibility in data science research.*

Operating Systems, *Programming skill, concepts and creation of algorithmic modules in the scope of computer operating systems. Topics include: CPU, memory access, memory pages, kernels, software launching and running and similar concepts.*

Senior Thesis, *First and /or second reader for senior comprehensive projects.*

Data Analytics, *Programming and analysis for the extraction of meaningful information from raw data using statistical models, programming and data science. Includes material of ethics and responsibility in data science research.*

Bioinformatics, *DNA, Protein sequence analysis, gene expression, proteomics, post-tranalational modifications and in relation to domains, etc.*

Discrete Structures, *Mathematics and programming, estimation, graph theory, probability statistics, numerical analysis, etc.*

Databases, *SQL schema design, programming syntax to store and extract data.*

Junior Seminar, *Theory, research and methods for success in CS careers.*

Theory of Computing, *Logic, turing machines, automata, designs of input-output control mechanisms.*

Internship Seminar, *A course designed to help students get into internships to allow them to gain experience and skill in their areas of Computer Science.*

Selected Peer Review Service

April 2022 **Briefings in Bioinformatics**.
March 2022 **Briefings in Bioinformatics**.
July 2020 **SIGITE 2020**.
February 2019 **Briefings in Bioinformatics**.
December 2015 **Journal of Theoretical Biology**.
July 2014 **ACM BCB 2014**.
Jan 2015 **Briefings in Bioinformatics**.
May 2014 **BMC**.
January 2014 **ECIS2014**.
Sept 2013 **Briefings in Bioinformatics**.
July 2013 **Briefings in Bioinformatics**.
March 2013 **SciVerse ScienceDirect**.

February 2013 **SciVerse ScienceDirect**.

February 2013 **ECIS2013**.

September 2012 **Briefings in Bioinformatics**.

August 2012 **Briefings in Bioinformatics**.

January 2012 **ECIS2012**.

Selected Community Service

2017 **QR (Quantitative Reasoning) Tag creation committee**, *Creating a learning outcome rubric for the Quantitative Reasoning requirement*, Allegheny College.

2017 **Young Student Outreach Teaching**, *Computer video game programming instruction*, Allegheny College.

2017 **26th Annual Sigma Xi Conference**, *Judge of undergraduate biology research*, Penn State Behrend, Held in Erie, PA.

2017 **Fourth Biannual Undergraduate Bioinformatics Education Conference**, *Presenter of bioinformatics teaching strategy for undergraduates*, St. Vincent College, Latrobe, PA.

2013-2016 **Volunteer bioinformatics workshop**, *Presenter of bioinformatics publications for undergraduates*, Omaha, Ne.

2013-2016 **Volunteer bioinformatics workshop**, *Grade-school children's science*, Omaha, Ne.

2012-2016 **Volunteer open house guide and presenter**, *University of Nebraska at Omaha*, Bioinformatics.

2014 **Guest presenter and Speaker**, *Talk: Skills for success*, Given to new 2014 Ph.D. student class, University of Nebraska at Omaha.

2015 **Volunteer scout master**, *Tiger Scouts of America (Boy Scouts group)*, Group coordinator for Troup 244, Meadville, PA.

2012 **Volunteer ICCS computer science conference**, *University of Nebraska at Omaha*, Group coordinator.

Talks

Decemebr 2021 **Faculty Lecture Series at Allegheny College**: *Integrating Responsibility Into Computing*Info Link: `https://www.youtube.com/watch?v=A8QsWP9NGUs`

March 2021 **MozFest: Mozilla Festival**: *Responsible Computing Curricula – How do we do it?* Info Link: `https://schedule.mozillafestival.org/session/877N8H-1`

March 2017 **Teaching Integrated Bioinformatics**: *St Vincent College*Convention of PA Bioinformatics Instructors

Awards and Grants

June 2022 **GRANT: Demmler**: DATA SCIENCE Curriculum grant,Allegheny College,Award amount: $1250

June 2022 **GRANT: Demmler**: MICRO-CREDENTIAL development grant,Allegheny College,Award amount: $1250

Feb 2021 **GRANT: Demmler**: INTEGRATIVE INFORMATICS Curriculum grant,Allegheny College,Award amount: $625

Feb 2021 **GRANT: Demmler**: ECON Curriculum grant,Allegheny College,Award amount: $1250

March 2021 **GRANT**: Principle Investigator for grant entitled, *Responsible Computer Science Challenge: Stage II* of the Mozilla Foundation. Award amount: $64,000

March 2019 **GRANT**: Principle Investigator for grant entitled, *Responsible Computer Science Challenge: Stage I* of the Mozilla Foundation.Award amount: $144,000

Janurary 2016 **AWARD**: Helen Hansen Outstanding Graduate Student Award, University of Nebraska at Omaha Award amount: $500

December 2015 **AWARD**: Dissertation Scholarship, University of Nebraska at Omaha Award amount: $1,500

August 2015 **GRANT**: Recipient of the *NASA Nebraska Space Grant Fellowship*, NASA Nebraska Space Grant & EPSCoR, 6001 Dodge Street, CB 041, Omaha, NE 68182. Grant amount: $5,000

June 2015 **AWARD**: Anjuman Ara Changez Award of Academic Achievement, University of Nebraska at Omaha Award amount: $1,500

April 2015 **AWARD**: NASA recognition for research, Nebraska Academy of Science, Lincoln, NE

August 2014 **GRANT**: Recipient of the *NASA Nebraska Space Grant Fellowship*, NASA Nebraska Space Grant & EPSCoR, 6001 Dodge Street, CB 041, Omaha, NE 68182. Grant amount: $5,000

April 2014 **AWARD**: First Place: *Best Paper*, Student Capstone Conference, College of Information Science and Technology, Peter Kiewit Institute, Omaha, Nebraska. Award amount: $1,000

April 2014 **AWARD**: Second Place: *Award of Excellence in Research*, Student Capstone Conference, College of Information Science and Technology, Peter Kiewit Institute, Omaha, Nebraska. Award amount: $500

April 2014 **AWARD**: NASA recognition for research, Nebraska Academy of Science, Lincoln, NE

July 2013 **GRANT**: Recipient of the *NASA Nebraska Space Grant Fellowship*, NASA Nebraska Space Grant & EPSCoR, 6001 Dodge Street, CB 041, Omaha, NE 68182. Grant amount: $5,000

April 2013 **AWARD**: First Place: *Award of Excellence in Research*, Student Capstone Conference, College of Information Science and Technology, Peter Kiewit Institute, Omaha, Nebraska. Award amount: $1,000

Memberships

2013 to Present IEEE: Institute of Electrical and Electronics Engineers

2013 to Present ACM: Association for Computing Machinery

2015 to Present Delta Epsilon Iota: Academic Honor Society, University of Nebraska at Omaha Chapter

Education

2010 – 2016 **Ph.D. in Information Technology - Bioinformatics**, *University of Nebraska, PKI (UNO), Omaha*, *Bioinformatics*, Advisors: Dr. Dhundy (Kiran) Bastola and Dr. Hesham Ali.
Dissertation Thesis: "Patterns and Signals of Biology: An Emphasis On The Role of Post Translational Modifications in Proteomes for Function and Evolutionary Progression." University of Nebraska at Omaha, August 2016.

2007 – 2009 **MS - Mathematics**, *University of Nebraska (UNO), Omaha*, *Mathematics with applications in Bioinformatics/Mathematical Biology*.

Undergraduate Mathematics Course Work, *University of Nebraska, Omaha*, *Preparation for Masters graduate school*.

Undergraduate Mathematics Course Work, *Conservatoire National des Arts et Métiers, Paris, France*, *General Mathematics with applications in Science*.

English Technical Writing Workshop, *Creighton University*.

French Cultural Studies, *Université de La Sorbonne, Paris, France*, Diplômé: *La Civilisation Française*:*French Linguistics, Culture and Literature*.

BS - Biology, *Creighton University, Omaha*, *Biology, biostatistics, and Biochemistry*.

Diplomé, *Université Stendhal-Grenoble 3*, *"Perfection of Oral French" and "Perfection of Written French"*.

Languages

English Maternal

French Fluent (*Ô, Mais oui!)*

Computer Skills/Software

OS: Linux, Mac, Windows

Web development: HUGO, Jekyll, JavaScript, HTML, page layout

General: Git and GitHub programming, OpenOffice

Programming: Python, JavaScript, C/C++, Java, LaTeX, R-statistic, GoLang

Graphics: DALL·E, GIMP, PhotoShop, Krita, Inkscape, lender, Creation via `www.canva.com`

Cloud Computing: Docker, Kubernetes, AWS, VPN's, cloud computing setup and operations

Video: OBS, OpensShot, green screening, microphone adjustment, video recording, YouTube video channel growing

Mathematical: Maple, Mathematica, R-Statistic, SPSS, Octave, MatLab

Interests

Research Academic research in Bioinformatics: *text mining*, *gene expression correlation in disease*, *data analytics at large-scale* and *Analysis by methods of Information Theory*

Biking Long biking trips are exciting.

Tennis My game still needs some work...

Physical Sciences Most of my favorite classes, books and trips to museums have been to learn about science.

Using plastics Just kidding: No plastics, please.