ALEXANDER MICHAEL LALEJINI

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EDUCATION

Dual Ph.D., in Computer Science and Ecology, Evolutionary Biology, & Behavior *Expected: 2021*
Michigan State University, East Lansing, MI
Research advisor: Dr. Charles Ofria

Bachelors of Science in Computer Science (summa cum laude) *May 2015*
Mississippi State University, Starkville, MS
Research advisor: Dr. Cindy Bethel

PUBLICATIONS

Find a more complete listing with associated materials here: https://lalejini.com/publications/.

Google scholar profile: https://bit.ly/lalejini-scholar

* = denotes undergraduate mentee co-authors

Peer-reviewed journal articles

- Emily Dolson, **Alexander Lalejini**, Steven Jorgensen*, and Charles Ofria. (2020). Interpreting the Tape of Life: Ancestry-based metrics and visualizations provide insights and intuition about evolutionary dynamics. Artificial Life. MIT Press. DOI: 10.1162/artl_a_00313

Peer-reviewed conference articles

- Clifford Bohm, **Alexander Lalejini**, Jory Schossau, and Charles Ofria. (2019). MABE 2.0: an introduction to MABE and a road map for the future of MABE development. In Proceedings of the Genetic and Evolutionary Computation Conference Companion (GECCO '19), Manuel López-Ibáñez (Ed.). ACM, New York, NY, USA, 1349-1356. https://doi.org/10.1145/3319619.3326825
- Jose Guadalupe Hernandez, **Alexander Lalejini**, Emily Dolson, and Charles Ofria. (2019). Random subsampling improves performance in lexicase selection. In Proceedings of the Genetic and Evolutionary Computation Conference Companion (GECCO '19), Manuel López-Ibáñez (Ed.). ACM, New York, NY, USA, 2028-2031. https://doi.org/10.1145/3319619.3326900
- **Alexander Lalejini**, Emily Dolson, Clifford Bohm, Austin J. Ferguson, David P. Parsons, Penelope Faulkner Rainford, Paul Richmond, and Charles Ofria (2019). Data Standards for Artificial Life Software. The 2019 Conference on Artificial Life, 507–514. https://doi.org/10.1162/isal_a_00213
- **Alexander Lalejini** and Charles Ofria. (2018). Evolving event-driven programs with SignalGP. In Proceedings of the 2018 Genetic and Evolutionary Computation Conference (GECCO). pp. 1135-1142. DOI: 10.1145/3205455.3205523. ACM.
- Emily Dolson, **Alexander Lalejini**, Steven Jorgensen*, and Charles Ofria. (2018). Quantifying the tape of life: Ancestry-based metrics provide insights and intuition about evolutionary dynamics. In Proceedings of the 2018 Conference on Artificial Life (ALIFE). Edited by Takashi Ikegami,

Nathaniel Virgo, Olaf Witkowski, Mizuki Oka, Reiji Suzuki, and Hiroyuki Iizuka. pp. 75-82. DOI: 10.1162/isal_a_00020. MIT Press.

- **Alexander Lalejini**, Michael J. Wiser, and Charles Ofria. (2017). Gene duplications drive the evolution of complex traits and regulation. In Proceedings of the 14th European Conference on Artificial Life (ECAL) 2017. Edited by Carole Knibbe, Guillaume Beslon, David Parsons, Dusan Misevic, Jonathan Rouzaud-Cornabas, Nicolas Bredèche, Salima Hassas, Olivier Simonin, and Hédi Soula. Vol 14. pp. 257-264. DOI: 10.7551/ecal_a_045. MIT Press.
- **Alexander Lalejini** and Charles Ofria. (2016). The evolutionary origins of phenotypic plasticity. In Artificial Life XV: Proceedings of the Fifteenth International Conference on the Synthesis and Simulation of Living Systems (ALIFE). Edited by Carlos Gershenson, Tom Froese, Jesus M. Siqueiros, Wendy Aguilar, Eduardo J. Izquierdo and Hiroki Sayama. Vol 14. pp. 372-379. DOI: 10.7551/978-0-262-33936-0-ch063. MIT Press.
- Christopher R. Hudson, **Alexander Lalejini**, Brandon Odom, Daniel W. Carruth, Cindy L. Bethel, Phillip J. Durst, and Christopher Goodin. (2015). ANVEL-ROS: The integration of the robot operating system with a high-fidelity simulator. In Proceedings of the 2015 Ground Vehicle Systems Engineering and Technology Symposium (GVSETS). p. 378.
- **Alexander Lalejini**, Dexter Duckworth, Richard Sween, Cindy L. Bethel, and Daniel W. Carruth. (2014). Evaluation of supervisory control interfaces for mobile robot integration with tactical teams. In Proceedings of 2014 IEEE Workshop on Advanced Robotics and Its Social Impacts (ARSO). pp 1-6. DOI: 10.1109/ARSO.2014.7020971. IEEE.

Peer-reviewed abstracts

These are short (usually 2-page) summaries of research recently published or to be published elsewhere. They are usually held to slightly lower peer-review standards than full papers submitted to the same venue and are often presented as posters rather than talks.

- **Alexander Lalejini** and Charles Ofria. (2019). Tag-accessed memory for genetic programming. In Proceedings of the Genetic and Evolutionary Computation Conference Companion (GECCO '19), Manuel López-Ibáñez (Ed.). ACM, New York, NY, USA, 346-347. DOI: `https://doi.org/10.1145/3319619.3321892`
- **Alexander Lalejini** and Charles Ofria. (2018). Evolving reactive agents with SignalGP. In Proceedings of the 2018 Conference on Artificial Life (ALIFE). Edited by Takashi Ikegami, Nathaniel Virgo, Olaf Witkowski, Mizuki Oka, Reiji Suzuki, and Hiroyuki Iizuka. pp. 368-369. DOI: 10.1162/isal_a_00069. MIT Press.

Book chapters

- Austin J. Ferguson, Jose G. Hernandez, Daniel Junghans*, **Alexander Lalejini**, Emily Dolson, Charles Ofria (2020). Characterizing the Effects of Random Subsampling on Lexicase Selection. In: Banzhaf W., Goodman E., Sheneman L., Trujillo L., Worzel B. (eds) Genetic Programming Theory and Practice XVII. Genetic and Evolutionary Computation. Springer, Cham
- **Alexander Lalejini** and Charles Ofria (2019). What Else Is in an Evolved Name? Exploring Evolvable Specificity with SignalGP. In Banzhaf W., Spector L., Sheneman L. (eds) Genetic Programming Theory and Practice XVI. Genetic and Evolutionary Computation. Springer, Cham
- Emily Dolson, **Alexander Lalejini**, and Charles Ofria. (2019). Exploring Genetic Programming Systems with MAP-Elites. In Banzhaf W., Spector L., Sheneman L. (eds) Genetic Programming Theory and Practice XVI. Genetic and Evolutionary Computation. Springer, Cham

Miscellaneous

Miscellaneous scientific publications that are not peer reviewed.

- Nadine Strasser, **Alexander Lalejini**, and Charles Ofria (2020). Detecting the genetic signature of mutualisms from lineages. The 2020 Workshop on Symbiosis in Artificial Life at the 2020 Conference on Artificial Life.
- Lauren Gillespie, Emily Dolson, **Alexander Lalejini**, and Charles Ofria (2018). Changing Environments Drive the Separation of Genes and Increased Evolvability in NK-Inspired Landscapes. Late breaking abstract at The 2018 Conference on Artificial Life.

PRESENTATIONS

Find a more complete listing along with associated presentation materials at `https://lalejini.com/cv/#cv-presentations`

Talks

- *Environmental change, mutation rate, and the evolution of gene overlap* by Lauren Gillespie (speaker), Alexander Lalejini (speaker), Emily Dolson, and Charles Ofria. Presented at 2020 BEACON Congress. August 14, 2020. Virtual.
- *Evolving Signal-driven Digital Organisms with SignalGP* by Alexander Lalejini, Matthew Andres Moreno, and Charles Ofria. Presented at Evolution of Complex Life (ECLife). May 15, 2019. Atlanta, Georgia.
- *Random Subsampling Improves Performance in Lexicase Selection* by Jose Hernandez, Alexander Lalejini (speaker), Emily Dolson, Charles Ofria. Presented at The Genetic and Evolutionary Computation Conference (GECCO). July 12, 2019. Prague, Czech Republic.
- *Data Standards for Artificial Life Software* by Alexander Lalejini, Emily Dolson, Clifford Bohm, Austin J. Ferguson, David P. Parsons, Penelope Faulkner Rainford, Paul Richmond, and Charles Ofria. Presented at The 2019 Conference on Artificial Life. July 29, 2019. Newcastle upon Tyne, England.
- *Evolving reactive agents with SignalGP* by Alexander Lalejini and Charles Ofria. Presented at 2018 Conference on Artificial Life (ALIFE). July 26, 2018. Tokyo, Japan.
- *Evolving event-driven programs with SignalGP* by Alexander Lalejini and Charles Ofria. Presented at 2018 Genetic and Evolutionary Computation Conference (GECCO). July 17, 2018. Kyoto, Japan.
- *What else is in an evolved name? Exploring evolvable specificity with SignalGP* by Alexander Lalejini and Charles Ofria. Presented at Genetic Programming Theory and Practice XVI. May 18, 2018. Ann Arbor, MI (USA).
- *Evolving event-driven programs with SignalGP* by Alexander Lalejini. Presented at weekly BEACON Friday seminar. April 6, 2018. East Lansing, MI (USA).
- *Gene Duplications Drive the Evolution of Complex Traits and Regulation* by Alexander Lalejini, Michael J. Wiser, and Charles Ofria. Presented at 14th European Conference on Artificial Life (ECAL). September 5, 2017. Lyon, France.
- *Gene Duplications Drive the Evolution of Complex Traits and Regulation* by Alexander Lalejini, Michael J. Wiser, and Charles Ofria. Presented at 2017 Annual BEACON Congress. August 4, 2017. East Lansing, MI (USA).
- *The Evolutionary Origins of Phenotypic Plasticity* by Alexander Lalejini and Charles Ofria. Presented at 2016 Annual BEACON Congress. August 11, 2016. East Lansing, MI (USA).
- *The Evolutionary Origins of Phenotypic Plasticity* by Alexander Lalejini and Charles Ofria. Presented at Fifteenth International Conference on the Synthesis and Simulation of Living Systems (ALIFE). July 7, 2016. Cancun, Mexico.

- *Evaluation of supervisory control interfaces for mobile robot integration with tactical teams* by Alexander Lalejini, Dexter Duckworth, Richard Sween, Cindy L. Bethel, and Daniel W. Carruth. Presented at 2014 IEEE Workshop on Advanced Robotics and Its Social Impacts (ARSO). September 11, 2014. Evanston, IL (USA).

Posters

- *Tag-accessed Memory for Genetic Programming* by Alexander Lalejini and Charles Ofria. Presented at The Genetic and Evolutionary Computation Conference (GECCO). July 15, 2019. Prague, Czech Republic.
- *SignalGP* by Alexander Lalejini and Charles Ofria. Presented at Engineering Graduate Research Symposium. March 29, 2018. Michigan State University, East Lansing, MI.
- *Evolving event-driven agents with SignalGP* by Alexander Lalejini and Charles Ofria. Presented at 2018 Annual BEACON Congress. August 8, 2018. East Lansing, MI (USA).
- *The Evolutionary Origins of Phenotypic Plasticity* by Alexander Lalejini and Charles Ofria. Presented at Engineering Graduate Research Symposium. March 29, 2016. Michigan State University, East Lansing, MI.
- *Robot Control* by Alexander Lalejini and Cindy Bethel. Presented at Bagley College of Engineering Undergraduate Poster Competition. April 24, 2014. Mississippi State University, Starkville, MS.

FUNDED GRANTS & FELLOWSHIPS

NSF Graduate Research Fellowship (national award; 16% acceptance rate) 2017
Proposal: Biologically-inspired distributed control algorithms.

BEACON Science and Technology Center Research Grant 2016
Proposal: Does phenotypic plasticity promote evolvability?
Amount awarded: $59,525

Michigan State University Distinguished Fellowship (institutional award; 4% acceptance rate) 2015

BEACON Science and Technology Center Top Up Fellowship (departmental award) 2015

TEACHING

Co-instructor, Algorithms Engineering (CSE 431) Fall 2019
Michigan State University Computer Science Department, East Lansing, MI
Prepared lectures, homeworks assignments and exams, held regular office hours.
Led effort convert programming assignments to use the Mimir classroom platform.

Invited guest lecture: *Digital Evolution*, Evolutionary Computation (CSE 848) Fall 2018, 2019
Michigan State University Computer Science Department, East Lansing, MI

Teaching assistant, Algorithms Engineering (CSE 491) Spring 2017
Michigan State University Computer Science Department, East Lansing, MI
Held regular office hours and graded homework assignments and exams.

WORKSHOPS

Co-organizer, Emerging Researchers in Artificial Life Workshop July 2020
2020 Conference on Artificial Life (ALIFE), virtual
Workshop focused on students, post-docs, and junior researchers in the ALIFE community.
Offered opportunities for junior researchers to present research and network.

Co-organizer, Developing Software Standards for the Artificial Life Community July 2018
2018 Conference on Artificial Life (ALIFE) and 2018 BEACON Congress

Discussed best practices for standardizing data storage in the Artificial Life research community.
Developed data and tool standards for artificial life software systems.
I organized and led an effort to publish a summary of workshop outcomes.

AWARDS & HONORS

Honorable Mention, Recognition for outstanding research 2018
Michigan State University Engineering Graduate Research Symposium
Awarded for poster presentation titled, SignalGP

Best student paper 2016
2016 International Conference on the Synthesis and Simulation of Living Systems (ALIFE)
Awarded for paper titled, The Evolutionary Origins of Phenotypic Plasticity

Honorable Mention, Recognition for outstanding research 2016
Michigan State University Engineering Graduate Research Symposium
Awarded for poster presentation titled, The Evolutionary Origins of Phenotypic Plasticity

James Worth Bagley College of Engineering Student Hall of Fame 2015
Bagley College of Engineering at Mississippi State University

Honorable Mention, Outstanding Undergraduate Researcher 2015
Computing Research Association (CRA)

SERVICE & OUTREACH

Conference chair (elected), Emerging Researchers in Artificial Life Fall 2019 - Fall 2020
Led conference activities for junior researchers at the 2020 Artificial Life conference.

Mentor, Workshop for Avida-ED Software Development (WAVES) Summer 2020
Michigan State University, East Lansing, MI
Mentored two workshop participants over a 10 week period.
Mentees developed open-source software benefitting the Avida-ED software platform.

Mentor, Summer Research Opportunities Program (SROP) 2016 - 2019
Michigan State University, East Lansing, MI
SROP supports underrepresented undergraduates interested in graduate study and research careers.
As a mentor, I work closely with undergraduate mentees to develop and carry out summer research.

Co-instructor, 'Making a Game of It' summer camp for high school students Summer 2019
Michigan State University College of Engineering Summer Programs, East Lansing, MI
Prepared and co-instructed a one week intensive introduction to Python and video game design.

Volunteer, BEACON Outreach Activities 2015 - present
Michigan State University, East Lansing, MI
Teach students about evolution biology at elementary school science nights.
Help run the BEACON education booth at the annual MSU Science Festival.

Volunteer, Poolside judge for the National SeaPerch Challenge May 2014

Journal and conference reviews

- Artificial Life Conference (ALIFE): 2016 - 2020
- Genetic and Evolutionary Computation Conference (GECCO): 2018
- European Conference on Artificial Life (ECAL): 2017