gaier adam

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agaier.github.io

education

phd | computer science
inria, university of lorraine |
2015-present
- research: design exploration, evolutionary computation, bayesian optimization
- advisor: Jean-Baptiste Mouret

msc | autonomous systems
bonn-rhein-sieg university |
2012-2019
- research: neuroevolution, robotics, data-efficient optimization, control

msc | evolutionary and adaptive systems
university of sussex |
2011-2012
- research: biologically-inspired computation, insect intelligence, neuroevolution, hypernetworks

bsc | computer science
richmond american international university in london|
2002-2005
- research: species-conserving genetic algorithms for design

coursework

intelligence and ml
Adaptive Systems
Artificial Life
Computational Neuroscience
Intelligence in Animals and Machines
Language Engineering
Learning and Adaptivity
Maths for Complex Systems
Neural Networks
*Gaussian Process Summer School

robotics
Autonomous Mobile Robots
Maths for Robotics and Control
Multi-Agent Systems
Planning and Scheduling
Probabilistic Methods for Robotics
Principles of Cognitive Robotics
Robot Manipulation

experience

google brain (tokyo, japan) | research intern
2019
- developed methods to evolve weight agnostic neural networks (WANN) architectures which perform with random weights (weightagnostic.github.io/)
- published tool for replication and continuation of WANN experiments
- published general-purpose neuroevolution tool

inria (nancy, france) | doctoral researcher
2015 - present
- developed approach to combine Bayesian optimization and quality-diversity techniques for design exploration in computationally expensive domains
- published source code of approach (Surrogate-Assisted Illumination) applied to aerodynamic optimization
- improved data-efficiency of state-of-the-art neuroevolution algorithms by integrating machine learning techniques into the evolutionary process
- analyzed ability of quality-diversity techniques to tackle problems in highly deceptive objective spaces

bonn-rhein-sieg university (bonn, germany) | research associate
2012 - present
- developed techniques for aerodynamic design optimization and exploration
- evolved neural network controllers for terrain-aware fuel efficient vehicle control
- designed and taught masters level courses on evolutionary computation

tsinghua international school (beijing, china) | cs department head
2009 – 2011
- created school-wide CS curriculum for new K-12 international school
- taught CS courses to 7th to 12th grade students of mixed language abilities

various (beijing, china) | bartender, poker player, restaurant manager
2006 - 2010

Worked as a bartender, sound engineer, and musician at underground rock venue D-22 while supporting myself playing poker. Managed the Kro's Nest, a pizza place with all Chinese staff, becoming marketing lead when the restaurant became a chain.
- learned Chinese as a bartender, musician, and restaurant manager
- developed grit, mental resilience, and self-management skills as a poker player
- honed graphic design skills creating ads as marketing lead of a restaurant chain

awards

- Best Paper Award 2018
  Complex Systems at the Genetic and Evolutionary Computation Conference
- Best Paper Award 2017
  Complex Systems at the Genetic and Evolutionary Computation Conference
- Best Paper Award 2017
  AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference
- Drive-E Studienpreis 2015
  National award for outstanding student work in the field of electric mobility
- Pegge Scholarship 2011
  Awarded to an Evolutionary and Adaptive Systems student with high potential

papers / posters

published/accepted

- A Hagg, M Zaefferer, J Stork, **A Gaier** 2019: "Prediction of neural network performance by phenotypic modeling" *Genetic and Evolutionary Computation Conference (GECCO)*
- **A Gaier**, A Asteroth, JB Mouret, 2018: "Data-efficient design exploration through surrogate-assisted illumination" *Evolutionary Computation*
- ** ***Best Paper Award*** ** **A Gaier**, A Asteroth, JB Mouret, 2018: "Data-Efficient Neuroevolution with Kernel-Based Surrogate Models" *Genetic and Evolutionary Computation Conference (GECCO)*
- H Spieker, A Hagg, **A Gaier**, S Meilinger, A Asteroth, 2017: "Multi-stage evolution of single-and multi-objective MCLP" *Soft Computing*
- ** ***Best Paper Award*** ** **A Gaier**, A Asteroth, JB Mouret, 2017: "Data-Efficient Exploration, Optimization, and Modeling of Diverse Designs through Surrogate-Assisted Illumination" *Genetic and Evolutionary Computation Conference (GECCO)*
- ** ***Best Paper Award*** ** **A Gaier**, A Asteroth, JB Mouret, 2017: "Aerodynamic design exploration through surrogate-assisted illumination" *AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference*
- **A Gaier** 2015: "Evolutionary Design via Indirect Encoding of Non-Uniform Rational Basis Splines" *Genetic and Evolutionary Computation Conference (GECCO)*
- **A Gaier**, A Asteroth 2014: "Evolving look ahead controllers for energy optimal driving and path planning" *Innovations in Intelligent Systems and Applications (INISTA)*
- **A Gaier**, A Asteroth 2014: "Evolution of optimal control for energy-efficient transport" *Intelligent Vehicles Symposium*

under review

- **A Gaier**, D Ha, 2019: "Weight Agnostic Neural Networks"

posters

- **A Gaier**, A Asteroth, JB Mouret 2019: "Are quality diversity algorithms better at generating stepping stones than objective-based search?" *Genetic and Evolutionary Computation Conference (GECCO)*

teaching

bonn-rhein-sieg | lecturer

evolutionary computation: theory and application — 2015-2018

- master's level course
- designed topics, lecturers, exercises
- 20-30 students per semester
- top marks in department for student satisfaction

foundations of evolutionary algorithms — 2015

- bachelor's level course
- designed topics, lecturers, exercises

biologically-inspired optimization — 2013-2014

- master's level seminar
- supervised student projects on evolutionary algorithms and ant colony optimization

tsinghua international school | high school computer science department head

high school and junior high school computer science — 2009-2011

- taught core programming courses to students aged 10-18
- organized and taught elective courses in graphic design, web design, and robotics