Dongyang Kuang

Curriculum Vitae

Live in the moment. Learn from the past. Dream for the future.

PERSONAL INFO

Gender	Male
Citizenship	Chinese
Phone	512-560-9965
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Website	https://dykuang.github.io
Github	https://github.com/dykuang
LinkedIn	https://www.linkedin.com/in/dykuang

WORK EXPERIENCE

Postdoc Fellow Aug. 2019 - Present

University of Texas at Austin

Oden Institute for Computational Engineering & Sciences

Responsibilities: Database development, data mining, machine/deep learning, uncertainty quantification for magnetically confined fusion.

Postdoc Fellow Sep. 2017 - Jul. 2019

Dept. of Mathematics & Statistics, University of Ottawa

Data Science and Machine Learning Group

Responsibilities: Fusing theoretical power of classical theories and computational power from machine learning/deep learning together to develop useful tools in fields where traditional methods are usually dominant. Projects includes medical image registration and universal embedding of nonlinear dynamics.

Award: Affiliation Award with Vector Institute Toronto for Artificial Intelligence. [1]

Visiting Assistant Professor Aug. 2016 - Jun. 2017

Dept. of Mathematics, Southern Utah University

Responsibilities: Teaching math courses and conducting interdisciplinary research.

Graduate Assistant Jan. 2012 - May. 2016

Dept. of Mathematics, University of Wyoming

Responsibilities: Teaching math courses and tutoring in math assistant center.

EDUCATION

PhD. Applied Mathematics 2012-2016

University of Wyoming, Laramie, Wyoming

[1] Did not accept it due to change of job leaving Ontario, CA.

- GPA: 3.956/4.00
- Dissertation: **A Particle Method for Euler-Poincaré Equation and Its Applications in Analysis of Landmark Based Image Templates.**
- Advisor: *Prof. Long Lee.* Dept. of Mathematics. Univ. of Wyoming.

B.S. Applied Mathematics 2007-2011
University of Science and Technology of China, Hefei, Anhui, China

- GPA: 3.50/4.30
- Ranking: 29/100
- Thesis: **Numerical Integration of Two Variables Based on Small Amounts of Sample Points.**
- Advisor: *Prof. Jiansong Deng.* Dept. of Mathematics. Univ. of Sci. & Tech. of China.

PAPERS IN SUBMISSION

- **A 1d convolutional network for leaf and time series classification**
  Dongyang Kuang
  https://github.com/dykuang/dykuang.github.io/blob/master/Files/leaf.pdf

CONFERENCE PAPERS

- **Cycle-consistent training for Reducing Negative Jacobian Determinant in Deep Registration Networks**.
  Dongyang Kuang
  Simulation and Synthesis in Medical Imaging (SASHIMI) 2019
  LNCS, vol 11827, pp. 1–10, 2019.
  In conjunction with MICCAI 2019, October 13, 2019, Shenzhen, China
  https://doi.org/10.1007/978-3-030-32778-1_13

- **FAIM – A ConvNet Method for Unsupervised 3D Medical Image Registration.**
  Dongyang Kuang and Tanya Schmah
  Machine Learning in Medical Imaging (MLMI) 2019.
  LNCS vol 11861, pp. 1–9, 2019.
  In conjunction with MICCAI 2019, October 13, 2019, Shenzhen, China
  https://doi.org/10.1007/978-3-030-32692-0_74

JOURNAL PAPERS

- **Kinetics and mechanism of CO_2 gasification of coal catalyzed by Na_2CO_3, $FeCO_3$ and $Na_2CO_3 - FeCO_3$**
  Bang Xu, Qingxi Cao, Dongyang Kuang, Khaled.A.M.Gasem, Hertanto Adidharma, Dong Ding and Maohong, Fan.
  Journal of the Energy Institute.
  DOI: 10.1016/j.joei.2019.08.004. 2019

- **Landmark-based algorithms for group average and pattern recognition.**
  Snehalata Huzurbazar, Dongyang Kuang and Long Lee
  Pattern Recognition
  Volume 86, pp 172-187. 2019

- **Predicting kinetic triplets using a 1d convolutional neural network.**
  Dongyang Kuang and Bang Xu
  Thermochimica Acta
  Volume 669, pp 8-15. 2018

- **A geodesic landmark shooting algorithm for template matching and its applications.**
  Roberto Camassa, Dongyang Kuang and Long Lee
  SIAM Journal on Imaging Sciences.
  Volume 10, Issue 1, pp 303-334. 2017

- **Solitary waves and N-particle algorithms for a class of Euler-Poincaré equations.** *(Highlights of the Year 2016)*
  Roberto Camassa, Dongyang Kuang and Long Lee
  Studies in Applied Mathematics.
  Volume 137, Issue 4. pp 502–546. 2016.

- **A conservative formulation and a numerical algorithm for the double-gyre nonlinear shallow-water model.**
  Dongyang Kuang and Long Lee
  Numerical Mathematics: Theory, Methods and Applications.
  Volume 8. Issue. 4. pp 634-650. 2015.

- **Some optional methods of activation energy determination on pyrolysis**
  Bang Xu and Dongyang Kuang
  Kinetics and Catalysis.
  Volume 60. No. 2. 137-146. 2019.

- **Characterization of Powder River Basin coal pyrolysis with cost-effective and environmentally friendly composite Na-Fe catalysts in a thermo-gravimetric analyzer and a fixed-bed reactor**
  Bang Xu, Dongyang Kuang, Fangjing Liu, Wenyang Lu, Alexander K.Goroncyc, Ting He, Khaled Gasem and Maohong Fan
  International Journal of Hydrogen Energy.
  Volume 43, Issue 14, pp 6918-6935. 2018

SKILLS & INTERESTS

Programming:

- Most experienced: Python, Matlab
- Had experience: C, C++, R, Mathematica
- Least experienced: Sql, MongoDB, Shell

Languages:

- Chinese (Mandarin)
- English

Areas of Interests:

- Artificial Intelligence, Deep Learning, Machine Learning, Mathematical Modeling, Scientific Computing, Data Analysis

Hobbies:

- Travel, Hiking, Badminton, Table Tennis.

ACADEMIC PROJECTS

- **Fusion Database Development and Machine/Deep Learning** Aug. 2019 -
  Advisor: *Craig Michoski*
  Oden Institute. Univ. of Texas at Austin.

- **Deep Learning in Medical Imaging Focusing on Registrations**
  Sep. 2017 - May. 2019
  Advisor: *Prof. Tanya Schmah.*
  Dept. of Mathematics and Statistics. Univ. of Ottawa.

- **Deep Learning Tools for Helping Understanding Dynamics**
  Jan. 2018 - May. 2019
  Advisor: *Prof. Cristina Stoica*
  Dept. of Mathematics. Wilfrid Laurier Univeristy.

- **Spectral Matching Algorithms in Portable Raman Spectrometers**
  May. 2018 - Jun. 2018
  NRC-Ottawa Industrial Problem Solving Workshop, NRC, Ottawa

- **Visualization of Satellite Orientation Control via Changing Moment of Inertia**
  Oct. 2017 - Nov. 2017
  Advisor: *Prof. Tanya Schmah and Prof.Cristina Stoica*
  Dept. of Mathematics and Statistics. Univ. of Ottawa.

- **Several Projects in Pattern Classification** Sep. 2015 - Dec. 2015
  Advisor: *Prof. Cameron Wright.*
  Dept. of Electrical Engineering. Univ. of Wyoming

- **Bootstrap Sampling in Brief** Jan. 2015 - April 2015
  Advisor: *Prof. Blair Robertson.*
  Dept. of Statistics. Univ. of Wyoming

- **Simulation of Itô Stochastic Equations** Sep. 2014 - Dec. 2014
  Advisor: *Prof. Hakima Bessaih.*
  Dept. of Mathematics. Univ. of Wyoming

- **Numerical Solvers for Parabolic PDEs** Sep. 2014 - Dec. 2014
  Other Team Members: *Evan Anderson*
  Advisor: *Prof. Craig. C. Douglas.*
  Dept. of Mathematics, Univ.of Wyoming

- **Data Investigation for the Historical University Registration Data**
  Jan 2014 - May 2014
  Other Team Member: *TianZhixi Yin & Damian Stansbury*
  Advisor: *Prof. Craig. C. Douglas.*
  Dept. of Mathematics, Univ.of Wyoming

- **NURBS Time Series Research Model and Reconstruction of Missing Data** Jun. 2010 - Sep. 2010
  Other Team Member: *Lipeng Xiao*
  Advisor: *Prof. Chengxi Shao.*
  School of Computer Science and Technology, Univ. of Sci. & Tech. of China

- **Behavior Analysis of Mobile Phone Users** Feb. 2010 - Jun. 2010
  Other Team Member: *Wei Wang & Sixin Wu*
  Advisor: *Prof. Zhouwang Yang.*
  Dept. of Mathematics, Univ. of Sci. & Tech. of China

SEMINARS & TALKS

⋆ *indicates invited talks.*

- **Convnets, a different view of approximating diffeomorphisms in medical image registration** Dec 2018
  Shape Analysis, Stochastic Geometric Mechanics and Applied Optimal Transport Workshop, Banff International Research Station, Banff, Alberta

- **Improve Effectiveness of Spectral Matching in Portable Raman Spectrometers** May 2018
  NRC-Ottawa Industrial Problem Solving Workshop, NRC, Ottawa

- ⋆ **Medical image registration with neural networks** Apr 2018
  Statistical Learning Workshop, Univ. of Ottawa, Ottawa

- **2B or not 2B? – It is a mathematical question.** Feb 2017
  Chatham University, Pittsburgh, PA

- ⋆ **A Bayesian method on landmark momentum data for abnormality detection**
  RMMC-Functional Analytic and Statistical Methods in Error Prediction with Applications. Univ. of Wyoming, Laramie WY. Jun 2016
  Southern Utah University, Cedar City, Utah Oct 2016

- **Shape analysis based on landmark representation** May 2015
  Applied and Computational Mathematics Seminars, Univ. of Wyoming, Laramie WY

- **The N-particle system for EPDiff and its applications in shape analysis** Mar 2015
  Graduate Students Seminars, Univ. of Wyoming, Laramie WY

CONFERENCES & WORKSHOPS

- 22nd International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI 2019). Oct. 2019
  Shenzhen, China.

- Shape Analysis, Stochastic Geometric Mechanics and Applied Optimal Transport. Dec 2018
  Banff International Research Station, Alberta, Canada

- 32nd Conference on Neural Information Processing Systems (NeurIPS) Dec 2018
  Montreal, Quebec, Canada

- NRC-Ottawa Industrial Problem Solving Workshop. May 2018
  Fields Institute - Canada National Research Council - University of Ottawa
- Geometric PDEs and Their Approximation. Jan 2016
  Texas A&M Univ., College Station, Texas, US.
- Rocky Mountain Mathematics Consortium (RMMC)
  - *Functional Analytic and Statistical Methods in Error Prediction with Applications.* Jun 2016
  Univ. of Wyoming, Laramie, Wyoming, US.
- Rocky Mountain Mathematics Consortium (RMMC)
  - *Stochastic Differential Equations.* Jun 2014
  Univ. of Wyoming, Laramie, Wyoming, US.

HONORS & AWARDS

- March. 2019: Affiliation Award with Vector Institute for Artificial Intelligence. [2]
- Nov. 2015: Travel award for winter school
  "Geometric PDEs and Their Approximation" in TAMU. January 10-15, 2016
- 2012-2016: Graduate assistantship, Univ. of Wyoming
- 2010-2011:
  - National endeavor fellowship (Grade 1)
  - Tier I prize on the undergraduate research project
  - Tang Zhongyin scholarship
  - USTC outstanding student scholarship (Grade 3)
- 2009-2010:
  - National endeavor fellowship (Grade 1)
  - USTC outstanding student scholarship (Grade 3)
- 2008-2009: USTC outstanding student scholarship (Grade 3)

NON-ACADEMIC EXPERIENCE

- 2018: Volunteer of "*The Data Effect*" conference in Ottawa.
- 2016: Volunteer of CSSA (Chinese Students and Scholar Association).
- 2015: Participation in Pikes Peak badminton tounarment in Colorado.
- 2015-2016: Officer of university badminton club.
- 2010: Volunteer of USTC freshmen reception.
- 2008-2010: Student member of the class scholarship committee.

[2] Did not accept it due to change of job leaving Ontario, CA.