

Dongyang Kuang

Curriculum Vitae

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

PERSONAL INFO

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| Gender | Male |
| Citizenship | Chinese |
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| 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

¹Did 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>
- **SEER-net, a simple electroencephalogram based emotion recognition network.**
Dongyang Kuang and Craig Michoski

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 Schmäh
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

- **Dual stream neural networks for brain signal classification**
Dongyang Kuang and Craig Michoski
Journal of Neural Engineering.
DOI: <https://doi.org/10.1088/1741-2552/abc903>

- **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. Volume 93, Issue 3, pp 922 - 933. 2020
- **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 thermogravimetric 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, SQL, MongoDB, Shell, Julia

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

- **Real Time Tracking and Analysis Tool on Students' Attention in Online Classroom.**

Nov. 2019 -

Advisor: *Craig Michoski*

Oden Institute. Univ. of Texas at Austin.

- **Toolkit Development for Plasma Linear Experiment (PLX) Data Analysis.**

Nov. 2019 -

Advisor: *Craig Michoski*

Oden Institute. Univ. of Texas at Austin.

- **EEG-based Brain Computer Interface: Recognition and Classification**

Oct. 2019 -

Advisor: *Craig Michoski*

Oden Institute. Univ. of Texas at Austin.

- **Fusion Database Development and Machine/Deep Learning**

Aug. 2019 -

Advisor: *Craig Michoski*

Oden Institute. Univ. of Texas at Austin.

- **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 University.

- **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 Schmäh 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 tournament in Colorado.
- 2015-2016: Officer of university badminton club.
- 2010: Volunteer of USTC freshmen reception.
- 2008-2010: Student member of the class scholarship committee.

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