Birgul Koc

Department of Mathematics
225 Stanger Street Blacksburg, VA 24061
540-553-5495
birgul@vt.edu

Cirriculum Vitae

Academic Position

August 2016 –   **Ph.D**, *Department of Mathematics, Virginia Tech, Blacksburg, USA*.
— *Expected date of completion : May 2021*
— *Thesis Title : Numerical Analysis of Variational MultiScale Data-Driven Reduced Order Model for Fluid Flows*
— *Advisor : Professor Traian Iliescu*

Education

August 2016 –
December 2018   **Virginia Tech, Blacksburg, USA**, *M.S. Mathematics*.
— *Advisor : Professor Traian Iliescu*
— *Thesis : Commutation Error in Reduced Order Modeling*
— *GPA : 3.58/4.00*

September 2009 –
June 2014   **Middle East Technical University, Ankara, Turkey**, *B.S. Mathematics*.
— *GPA : 3.24/4.00*

Research Interests

Applied mathematics, turbulent fluid flows, reduced order model, closure model, data-driven method, variational multiscale, and numerical analysis.

Awards

2020   SIAM Student Travel Award to attend The Second Joint SIAM/CAIMS Annual Meeting (AN20)

2020   Travel Award for SIAM-SEAS 2020

Publications

Koc. B., Rubino, S., Schneier, M., Singler, J. R., and Iliescu, T. *On Optimal Pointwise in Time Error Bounds and Difference Quotients for the Proper Orthogonal Decomposition.* arXiv :2010.03750.

Mou, C., Koc, B., San, O., Rebholz, L. G., and Iliescu, T. (2020). *Data-driven variational multiscale reduced order models.* CMAME.

Long-time Reynolds averaging of reduced order models for fluid flows : Preliminary results. LC Berselli, T Iliescu, B Koc, R Lewandowski. Mathematics in Engineering 2 (1), 1-25

Koc, B., Mohebujjaman, M., Mou, C., and Iliescu, T. (2019). *Commutation error in reduced order modeling of fluid flows.* Advances in Computational Mathematics, 45(5-6) :2587–2621.

Koc, B. (2018). Commutation Error in Reduced Order Modeling (Master's thesis). Retrieved from http://hdl.handle.net/10919/87537.

Conferences

2020   **Center for Mathematics and Artificial Intelligence (CMAI)**, *George Mason University, virtual*, Title :Data-Driven Variational Multiscale Reduced Order Models.

2020   **The Second JointSIAM/CAIMS Annual Meeting (AN20)**, *Canada, virtual*, Title :Data-Driven Variational Multiscale Reduced OrderModels.

2019   **Finite Element Circus**, *Virginia Tech*, Title :Variational Multiscale Data-Driven Closure Reduced Order Model.

2019   **SIAM Southeastern Atlantic Section Meeting**, *Tennessee*, Title :Data-Driven Variational Multiscale Reduced Order Model (DD-VMS-ROM).

2019   **SIAM Conference on Computational Science and Engineering**, *Washington*, Title : The Commutation Error for Large Eddy Simulation Reduced Order Models (LES-ROMs).

2018   **Fall Fluid Mechanics Symposium**, *Virginia Tech*, Title :Commutation Error in Reduced Order Modeling.

2018   **9th Annual Graduate Student Mini-conference in Computational Mathematics**, *South Carolina*, Title : Large Eddy Simulation Reduced Order Modeling.

2017   **Conference on Classical and Geophysical Fluid Dynamics :Modeling, Reduction and Simulation**, *Virginia Tech*.

2017   **VT Graduate Student Conference**, *Virginia Tech*, Title :Spatial Filtering of Reduced Order Models.

Teaching

RA   Research Assistant, Virginia Tech

TA   Teaching Assistant, Virginia Tech

     –Fall 2016, Spring 2017, Fall 2017, and Spring 2018 semesters

     –Helped students that were taking online math courses to answer their questions.

Instructor   Instructor, Virginia Tech

     –For Fall 2018 and Fall 2019, Instructor for MATH 1225 : Calculus I

     –For Spring 2019 Instructor for MATH 1226 : Calculus II

     –Responsible for 4 days 50 minute lecture.

     –Responsible for grading weekly homeworks, four mid-terms and final exam.

     –Hosted office hours thrice weekly.