

# Dat Tien Cao

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## Education

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- 07.2015 PH.D. IN MATHEMATICS, University of Missouri, Columbia, MO, USA  
Advisor: Professor Igor E. Verbitsky
- 07.2008 M.S. IN ANALYSIS AND APPLIED MATHEMATICS, Université d'Orléans, Orléans, France
- 06.2006 B.S. IN MATHEMATICS, Vietnam National University of Ho Chi Minh City, Ho Chi Minh City, Vietnam

## Employment

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- 08.2019 - present ASSISTANT PROFESSOR, Minnesota State University, Mankato, MN, USA
- 08.2016 - 07.2019 POSTDOCTORAL FELLOW, Texas Tech University, Lubbock, TX, USA
- 08.2015 - 07.2016 POSTDOCTORAL FELLOW, University of Tennessee, Knoxville, TN, USA
- 06. 2006 - 07.2009 LECTURER, Vietnam National University of Ho Chi Minh City, Ho Chi Minh City, Vietnam

## Research Interests

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- Partial Differential Equations, Harmonic Analysis, Nonlinear Potential Theory, and Applied Mathematics

## Publications/Preprints

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10. D. Cao, L. Hoang and T. Kieu, *Infinite series asymptotic expansions for decaying solutions of dissipative differential equations with non-smooth nonlinearity*, (2021), 30 pages, submitted.
9. D. Cao and L. Hoang, *Asymptotic expansions with exponential, power, and logarithmic functions for non-autonomous nonlinear differential equations*, **Journal of Evolution Equations**, (2020), 1-47, in press.
8. D. Cao and L. Hoang, *Asymptotic expansions in a general system of decaying functions for solutions of the Navier-Stokes equations*, **Annali di Matematica Pura ed Applicata**, Vol. 199, No. 3 (June 2020), 1023-1072.
7. D. Cao and L. Hoang, *Long-time asymptotic expansions for Navier-Stokes equations with power-decaying forces*, **Proc. Roy. Soc. Edinburgh Sect. A**, Vol. 150, No.2 (April 2020), 569-606.
6. D. Cao, T. Mengesha, and T. Phan, *Gradient estimates for weak solutions of linear elliptic systems with singular-degenerate coefficients*, **AMS Contemporary Mathematics**, vol. 725 (2019), 13-33.

5. D. Cao, T. Mengesha, and T. Phan, *Weighted- $W^{1,p}$  estimates for weak solutions of degenerate and singular elliptic equations*, **Indiana Univ. Math. J.**, 67 No. 6 (2018), 2225-2277.
4. D. Cao, A. Ibragimov, and A. I. Nazarov, *Mixed boundary value problems for non-divergence type elliptic equations in unbounded domain*, **Asymptot. Anal.**, 109 (2018), 75-90.
3. D. Cao and I. Verbitsky, *Nonlinear elliptic equations and intrinsic potentials of Wolff type*, **J. Funct. Anal.**, 272 (2017), 112-165.
2. D. Cao and I. E. Verbitsky, *Pointwise estimates of Brezis-Kamin type for solutions of sublinear elliptic equations*, **Nonlinear Anal.**, 146 (2016), 1-19.
1. D. Cao and I. E. Verbitsky, *Finite energy solutions of quasilinear elliptic equations with sub-natural growth terms*, **Calc. Var. Partial Differential Equations**, 52 (2015), 529-546.

## Work in Progress

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2. Lorentz estimates for weak solutions of elliptic equations with singular-degenerate coefficients, (with T. Phan), 24 pp, manuscript.
1. Weighted quasilinear elliptic equations, 14 pp, in preparation.

## Honors and Awards

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- Graduate student travel grant to AMS sectional meetings, AMS, 03/2015.
- Meritorious Performance on the January 2010 Ph.D. Qualifying Exam in Analysis, 2010.
- Departmental Fellowships, University of Missouri-Columbia, 2009.
- Outstanding Student Scholarships, University of Science, Ho Chi Minh City, Vietnam, 2002-2006.

## Teaching Experience

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- Courses taught at the Minnesota State University, Mankato, USA
 

<i>Summer II 2021</i>	Math 122: Calculus II
<i>Spring 2021</i>	Math 316: Intermediate Analysis and Math 411/511: Introduction to Complex Variables
<i>Fall 2020</i>	Math 321: Ordinary Differential Equations and Math 625: Complex Variables
<i>Summer II 2020</i>	Math 122: Calculus II
<i>Spring 2020</i>	Math 316: Intermediate Analysis and Math 422/522: Partial Differential Equations
<i>Fall 2019</i>	Math 247: Linear Algebra I and Math 321: Ordinary Differential Equations
- Courses taught at the Texas Tech University, Lubbock, TX, USA
 

<i>Summer I 2019</i>	Higher Mathematics for Engineers and Scientists I
<i>Spring 2019</i>	Higher Mathematics for Engineers and Scientists I (large lecture)
<i>Fall 2018</i>	Higher Mathematics for Engineers and Scientists I (large lecture)
<i>Spring 2018</i>	Calculus III (large lecture)
<i>Fall 2017</i>	Calculus III (large lecture)
<i>Summer I 2017</i>	Calculus II
<i>Spring 2017</i>	Calculus II (large lecture)
<i>Fall 2016</i>	Calculus I (large lecture)

- Courses taught at the University of Tennessee, Knoxville, TN, USA
  - Spring 2016*      Calculus I (two sections)
  - Fall 2015*        Calculus I (two sections)
- Recitation sections at the University of Missouri, Columbia, MO, USA
  - Spring 2015*      Calculus I (two sections)
  - Fall 2014*        Pre-Calculus (three sections)
  - Spring 2014*      Calculus I (two sections)
  - Fall 2013*        Calculus I (two sections)
  - Fall 2012*        Pre-Calculus (three sections)
  - Spring 2012*      Pre-Calculus (three sections)
- Courses taught at Vietnam National University of Ho Chi Minh City
  - 2008-2009*        Calculus I, II, III (Instructor)
  - 2006-2007*        Functional Analysis, Advanced Calculus, Measure Theory (Recitation Instructor)

## Teaching Training/Workshop

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- Spring 2019      *Classroom Communication Workshop*, Texas Tech University, Lubbock, TX, USA.
- Fall 2015-2016    *Mentorship Program*, University of Tennessee, Knoxville, TN, USA.
- Spring 2012      *Course: Communication and Culture for American College Teaching*, University of Missouri, Columbia, MO, USA.
- Summer 2011     *Teaching Assistant Workshop*, University of Missouri, Columbia, MO, USA.
- Summer 2011     *Course: Tools for Teaching American Students*, University of Missouri, Columbia, MO, USA.

## Programming Skills

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- C++, FreeFEM++, MatLab.

## Conferences

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18. 2019 Joint Mathematics Meetings, AMS Special Session on Mathematical Analysis in Fluid Dynamics, Baltimore, MD, January 16-19, 2019.  
Talk: *Asymptotic expansions for solutions of non-autonomous differential equations.*
17. 2019 Joint Mathematics Meetings, AMS Special Session on Nonlinear Evolution Equations and Their Applications, Baltimore, MD, January 16-19, 2019.  
Talk: *Large-time asymptotic expansions in general systems of decaying functions for the Navier-Stokes equations.*
16. SIAM Texas-Louisiana Section, Mini-symposium session on Nonlinear partial differential equations and applications, Louisiana State University, October 5-7, 2018.  
Talk: *Quasilinear elliptic equations with weights.*
15. Vietnamese - French conference in Applied Mathematics, Vietnam National University Ho Chi Minh City, July 9-11, 2018.  
Talk: *Long-time asymptotic expansions for decaying solutions of Navier-Stokes equations.*

14. AMS Spring Eastern Sectional Meeting, Special Session on Nonlinear and Stochastic Partial Differential Equations and Applications, Northeastern University, Boston, MA, April 21-22, 2018  
Talk: *Asymptotic expansions for decaying solutions of Navier-Stokes equations.*
13. AMS Spring Southeastern Sectional Meeting, Special Session on Evolution Equations and Applications, Vanderbilt University, Nashville, TN, April 14-15, 2018  
Talk: *Long-time asymptotic expansions for solutions of Navier-Stokes equations with time-dependent forces.*
12. Ohio River Analysis Meeting 2018, University of Kentucky, Lexington, KY, 24-25 March 2018  
Talk: *Asymptotic expansions for solutions of Navier-Stokes equations.*
11. AMS Fall Central Sectional Meeting, Special Session on Integrable Systems and Applications, University of North Texas, Denton, TX, September 9-10, 2017.  
Talk: *Mixed boundary value problems for degenerate elliptic equations at infinity.*
10. 2017 Joint Mathematics Meetings, AMS Special Session on PDEs for Fluid flow: Analysis and Computation, Atlanta, GA, January 4-7, 2017.  
Talk: *Weighted estimates of solutions to degenerate and singular elliptic equations.*
9. AMS Southeastern Sectional Meeting, special session on “Sharp estimates and Bellman functions in Harmonic Analysis”, University of Georgia in Athens, GA, March 5-6, 2016.  
Talk: *Potential theory for quasilinear elliptic equations.*
8. The 35th Southeastern Atlantic Regional Conference on Differential Equations, University of North Carolina at Greensboro, October 10-11, 2015.  
Talk: *Pointwise estimates of solutions to sublinear elliptic equations.*
7. AMS Spring Southeastern Sectional Meeting, Special Session on Analysis on Nonlinear Integral and Partial Differential Equations, University of Alabama in Huntsville, March 27-29, 2015.  
Talk: *Potential theory for sublinear elliptic equations.*
6. The Fifth Ohio River Analysis Meeting, University of Cincinnati, Cincinnati, Ohio, February 28 - March 1, 2015.  
Talk: *Finite energy and weak solutions of sublinear elliptic equations.*
5. AMS Western Spring Sectional Meeting, Special Session on Harmonic Analysis and Operator Theory (in memory of Cora Sadosky), University of New Mexico, April 4-6, 2014.  
Talk: *Existence and pointwise estimates of solutions to subcritical quasilinear elliptic equations.*
4. AMS Southeastern Spring Sectional Meeting, Special Session on Harmonic Analysis and Nonlinear Partial Differential Equations, University of Tennessee, March 21-23, 2014.  
Talk: *Finite energy solutions of quasilinear elliptic equations with sub-natural growth terms.*
3. 30th Southeastern Analysis Meeting, Clemson University, March 7-8, 2014.  
Talk: *Finite energy solutions of quasilinear elliptic equations with sub-natural growth terms.*
2. The Third Ohio River Analysis Meeting, University of Cincinnati, Cincinnati, Ohio, March 9-10, 2013.  
Talk: *Existence and pointwise estimates of solutions to subcritical quasilinear elliptic equations.*
1. Quasilinear equations and singular problems, Tours, France, June 4-6, 2012.  
Poster: *Existence and pointwise estimates of solutions to subcritical quasilinear elliptic equations.*

## Seminars, Colloquia

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12. Colloquium, Department of Mathematics and Statistics, Minnesota State University, Mankato , September 29, 2020.  
Talk: *Long-time Asymptotic Expansion for Solutions of Non-autonomous Differential Equations.*
11. Colloquium, Department of Mathematics and Statistics, Minnesota State University, Mankato , March 12, 2019.  
Talk: *Long-time asymptotic expansions for solutions of Navier-Stokes equations.*
10. Colloquium, Department of Mathematics and Statistics, University of North Carolina Charlotte , November 2, 2018.  
Talk: *Asymptotic expansions for solutions of Navier-Stokes equations in a general class of decaying forces.*
9. Analysis Seminar, Texas Tech University, October 15 and 22, 2018.  
Talk: *Long-time asymptotic expansions in general systems of decaying functions for the Navier-Stokes equations.*
8. Analysis Seminar, Texas Tech University, April 30, 2018.  
Talk: *Weighted quasilinear elliptic equations in subcritical case.*
7. Analysis Seminar, Texas Tech University, April 9, 2018.  
Talk: *Large-time asymptotic expansions for solutions of Navier-Stokes equations.*
6. Joint Analysis and Applied Math Seminar, Texas Tech University, November 8, 2017.  
Talk: *Mixed boundary value problems for degenerate elliptic equations at infinity.*
5. Analysis Seminar, Texas Tech University, March 27 and April 5, 2017.  
Talk: *Weighted gradient estimates of solutions to degenerate and singular elliptic equations.*
4. Applied Math Seminar, Texas Tech University, September 28, 2016.  
Talk: *Potential theory for quasilinear elliptic equations.*
3. Colloquium, Department of Mathematics and Statistics, Texas Tech University, August 3, 2016.  
Talk: *Potential theory for quasilinear elliptic equations.*
2. Differential Equations Seminar, University of Tennessee, September 17 and 24, 2015.  
Talk: *Pointwise estimates of solutions of Brezis-Kamin type to sublinear elliptic equations.*
1. Analysis Seminar, University of Missouri, Columbia, Missouri, April 29, 2013.  
Talk: *Existence and pointwise estimates of solutions to subcritical quasilinear elliptic equations.*

## Conferences attended

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7. XVII Red Raider Minisymposium - Current Trends in Numerical Analysis and Scientific Computing, Texas Tech University, October 27, 2018.
6. West Texas Applied Math Graduate Minisymposium, Texas Tech University, 28 April, 2017.
5. 46<sup>th</sup> Annual John H. Barrett Memorial Lectures, The University of Tennessee, May 16-18, 2016.
4. CBMS Regional Conference in the Mathematical Sciences - Reflectionless measures, Wolff's potentials, and rectifiability, North Dakota State University, July 27-31, 2015.

3. 2015 Joint Mathematics Meetings, San Antonio, TX, January 10-13, 2015.
2. 13th New Mexico Analysis Seminar, An afternoon in Honor to Cora Sadosky, University of New Mexico, Albuquerque, New Mexico, April 3-4, 2014.
1. Equations dispersives sur les variétés, Orléans, France, April 9-11, 2008.

## Professional services

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- Referee for several Mathematics Journals.
- Reviewer for Mathematical Reviews.
- Assessment Committee, Fall 2020 - Spring 2021, Minnesota State University, Mankato
- Student Advancement Committee, Fall 2019-Spring 2020, Minnesota State University, Mankato
- Co-organizer of Analysis Seminar, Fall 2017-Spring 2019, Texas Tech University

## Membership

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- American Mathematical Society