

**Name:** Lilia GHAFFOUR

**Date and Place of Birth :** 01/04/1993, Mostaganem (Algeria)

**Family Situation:** Single

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### Education

- PhD candidate in the Division of Computer, Electrical & Mathematical Sciences & Engineering (CEMSE) at King Abdullah University of Science and Technology : August 2016
- 2014-2016: MSc student in Mathematics at the University of Mostaganem (Mathematics and Computer Science), Algeria.  
Project Title: Fractional Differential Singular Equations.  
*Ranked 2<sup>nd</sup> out of 52 graduates*
- 2011-2014: BSc in Mathematics, July 2014, Faculté des Sciences Exactes et Informatique (Mathematics and Computer Science), University of Mostaganem, Algeria.  
Project Title: The Fourier Transform and Applications in the Resolution of Partial Differential Equations.  
*Ranked 3<sup>rd</sup> out of 44 graduates*
- 2008-2011: Mohamed OKRAF High School, Salamandre, Mostaganem, Algeria.

### PhD Scholarship Award

Feb. 2016: Ranked 4<sup>th</sup> in the National Competition Exam for PhD Scholarships Award (to study abroad) out of 54 outstanding Top 5% applicants from different West Algerian Universities.

### Relevant Coursework

List of Core Courses:

- Advanced Topics in Control Theory
- Applied Partial Differential Equations I
- Numerical Linear Algebra
- Optimization, Convex Analysis, Linear Programming, Discrete and Continuous Numerical Optimization.
- Modeling and Analysis of Systems, Scientific Calculation.
- Control Theory, Positive Systems.
- Theory of Matrices, System and Representation of State.
- Theory of Fractional Integration, Fractional Differential Equations.

- Algebra, Topology.
- Analysis, Complex Analysis.
- Numerical Analysis, Numerical Methods, Method of the Finite Elements.
- Differential Equations, Partial Differential Equations.
- Equations of Physics Mathematics.
- Geometry, Differential Geometry, Euclidean and Affine Geometry.
- Probability, Descriptive Statistics.
- Theory of Operators.
- Measure Theory, Distribution.
- Mechanics, Electricity, Chemistry.
- Computer, Office Automation, Machine Structure, Web Technology, Formal Calculus.

## Research Experience

- In the BSc research project we dealt with the Fourier transform which is a very useful mathematical tool for signal processing in physics and image processing in the computer field.  
**Title:** Fourier Transform and Applications to Solving partial Differential Equations.  
**Keywords:** Fourier Transform, Partial Differential Equations, the Usefulness of the Fourier Transform in Physical.  
**Work Achieved:** In our work, we used the Fourier transform to solve partial differential equations resulting physical phenomena such as the heat equation, Laplace's equation and the transport equation.  
**Impact:** After outlining the general knowledge and definitions, the application of the Fourier transform has allowed us to find exact analytical solutions of the equations previously mentioned.
- In the MSc research project we considered a more general and high dimensional singular coupled system of fractional differential equations in an arbitrary point in the real axis.  
**Title:** Singular Fractional Differential Equations  
**Keywords:** Caputo derivative, fixed point, differential equation, existence, uniqueness, singularity.  
**Work Achieved:** We considered a class of singular fractional differential equations such that its right hand side has an arbitrary singularity on an arbitrary interval of the real axis. Then, we discussed the existence and uniqueness of the solutions by using several fixed point theorems such as Banach contraction principle, Schaefer theorem and Schauder theorem.  
**Impact:** We obtained new results on the existence and uniqueness of solutions for the proposed coupled nonlinear fractional system. To the best of our knowledge, there are no papers that have developed the singular system in an arbitrary point in multi-variables, with arbitrary orders in each singular equation.
- **Article** entitled “On a Class of Fractional Differential Equations with Arbitrary Singularities” has been submitted to the Konuralp Journal of Mathematics in 2016.
- **Article** entitled “Fractional Differential Equations With Arbitrary Singularities” has been submitted to the Journal of Interdiscip. Math in 2016

## Other Skills

- Computer skills, software programs C/C++, Matlab, Scientific WorkPlace, Microsoft Software (Office Automation).

- Initiative, fast learner and team player.
- Fast adaptability to new situations/changes in the work environment, good communicator.

### **Langages**

- Arabic: Very Good (mother tongue).
- French: Very Good. Level B3 at the Algerian Academy of Accounting and Studies in Management (CACEG).
- English: Good. Level B2, Intensive Language Teaching Center (CEIL).
- Currently preparing the Toefel Exam (expected date Mai 2016)