

## EXPERT'S PROFILE



**Name of Grantee** : **DR. DENNIS I. MERINO**

**Area of Expertise** : Mathematical Sciences  
(Matrix Analysis)

**Inclusive Date of Contract as  
BSP Awardee** : 1 June 2009 – 31 July 2009  
Short-Term Program (Subsequent)

**Host Institutions** : Institute of Mathematics  
University of the Philippines Diliman

**Contact Details** : dmerino@selu.edu

## EDUCATIONAL BACKGROUND

- Ph.D. in Mathematical Sciences (Matrix Analysis), The Johns Hopkins University, Baltimore, Maryland, 1992
- M.S. in Engineering, The Johns Hopkins University, Baltimore, Maryland, 1990
- B.S. in Mathematics *summa cum laude*, University of the Philippines, Diliman, Quezon City, 1986

## WORK EXPERIENCE

- **2004 - present** - **Professor**  
Department of Mathematics  
Southeastern Louisiana University
- **1998 – 2004** - **Associate Professor**  
Department of Mathematics  
Southeastern Louisiana University
- **1992 – 1998** - **Assistant Professor**  
Department of Mathematics  
Southeastern Louisiana University
- **1989 – 1992** - **Teaching/Research Assistant**  
Department of Mathematical Sciences  
The Johns Hopkins University  
Baltimore, Maryland
- **1990 (summer)** - **Mathematician**  
Applied Physics Laboratory  
National Institutes of Health  
Bethesda, Maryland
- **1986 – 1988** - **Instructor**  
Department of Mathematics  
University of the Philippines  
Diliman, Quezon City

### To be accomplished as BSP Awardee:

1. Conduct lectures on Matrix Analysis (theory and applications) to various publics;
2. Collaborative research with faculty members of the Institute of Mathematics, UP Diliman and from other universities;
3. Complete the manuscripts of some collaborative research projects with UP Diliman to be submitted for publication in appropriate journal; and
4. Propose thesis/dissertation topics for both graduate and undergraduate students.

The most relevant experiences related to his profession and expertise are:

Professor Dennis I. Merino received his BS Mathematics degree from the University of the Philippines in 1986. In 1990, he received his Master of Science in Engineering degree and in 1992, his Ph. D. in Mathematical Sciences from The Johns Hopkins University under the guidance of Prof. Roger A. Horn. The title of his thesis is "Topics in Matrix Analysis." He is currently a professor of Mathematics at Southeastern Louisiana University, where he has been teaching for the past 17 years.

Professor Merino's expertise is in matrix factorization, particularly the analogs of the polar decomposition. One such decomposition is the real-coninvolutory factorization, that is, writing a matrix  $A = RE$ , where  $R$  has real entries and  $E$  is coninvolutory (its inverse is its complex conjugate). Another decomposition is the orthogonal-symmetric factorization, that is, writing a matrix  $A = QS$ , where  $Q$  is orthogonal (its inverse is its transpose) and  $S$  is symmetric. In general, if  $f$  is a nonsingular function (that is,  $f(A)$  is nonsingular whenever  $A$  is) satisfying  $f(AB) = f(B)f(A)$  and  $f(f(A)) = A$ , his interest lies in finding conditions for which a matrix can be written as a product  $A = QS$ , where  $Qf(Q) = I$  and  $f(S) = S$ . His studies also include the possible Jordan Canonical Forms and the possible singular value decompositions of classes of matrices.

Professor Merino has published articles in *Linear Algebra and Its Applications*, *Linear and Multilinear Algebra*, *SIAM J. on Matrix Analysis*, and *Matimyas Matematika*. He has collaborated with several colleagues and students including those from the University of the Philippines. His paper "Decompositions Involving Quaternion Matrices and Complex Partitioned Matrices" (with J. Villoria and appeared in *Matimyas Matematika*) was awarded the Outstanding Scientific Award by the National Academy of Science and Technology of the Philippines in 2006. In addition, he has been acting as a referee for several journals including *Linear Algebra and Its Applications*, *Linear and Multilinear Algebra*, and *The Mathematical Monthly*. He also writes reviews for *The Mathematical Reviews*.

He has been a co-advisor to two Ph. D. and one M.S. graduates from the Institute of Mathematics, University of the Philippines, Diliman. He has also been an advisor to a number of undergraduate research in Mathematics at Southeastern Louisiana University.

Professor Merino is a member of the Society for Industrial and Applied Mathematics, the International Linear Algebra Society, and the Mathematical Association of America.