

**Bijaya Shrestha, Ph.D.**  
**Associate Teaching Professor**

Department of Electrical and Computer Engineering, Missouri S&T, Jan 2014

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**Highest Degree Earned:**

Ph.D. University of Missouri-Rolla 1995

**Dissertation Title:**

Calculation of Gama Ray Efficiency and Response Function of a Germanium Detector Using Monte Carlo Techniques

**Number of years on this faculty:** 19

**Courses Taught at S&T**

EE (392) – *Senior Design Project (II)*  
EE (283) - *Electronics for Instrumentation*  
EE (282) – *Electronic Circuits and Machines*  
EE (281) – *Electrical Circuits*  
EE (275) – *Electromagnetics*  
EE (273) – *Fields and Waves II*  
EE (253) – *Electronics I*  
EE (243) - *Communication Systems*  
EE (225) – *Electronic and Photonic devices*  
EE (221) – *Principles of Semiconductor Devices*  
EE (207) – *Power System Analysis and Design*  
EE (206) - *Power System Design and Analysis*  
EE (153) – *Circuit Analysis II*  
EE (151) – *Circuit Analysis I*

NE (431) – *Radiation Shielding*  
NE (401) – *Nuclear Medical Science*  
NE (312) – *Radiation Measurements & Spectroscopy*  
NE (311) – *Reactor Physics (II)*  
NE (307) – *Nuclear Fuel Cycle*  
NE (303) – *Reactor Physics (I)*  
NE (205) – *Fundamentals of Nuclear Engineering*

**Authored a Book**

Campus Physics, 1980 – Ratna Pustak Bhandar, Kathmandu, Nepal

**Recognition**

**-Faculty Accomplishment Award**  
**-Outstanding Professor Award from the Eta Kappa chapter of Chi Omega**  
**-Fulbright Scholarship Recipient**  
**-Senior Member, IEEE**

### **Specific tutorial programs run for the benefit of students**

Since joining the department in 1996, I have been leading a weekly free tutorial help for my students. After the **LEAD** (LEarning Across the Disciplines) program was established, it has been associated with that program.

Offered tutorial classes on Electrical Circuits for students taking the Fundamentals of Engineering examination

### **Departmental Service**

#### **Supervising Graduate Teaching Assistants in their instruction in the laboratory**

ECE 255 – Electronics I Laboratory (three semesters)

ECE 154 – Circuit Analysis II Laboratory (four semesters)

ECE 152 – Circuit Analysis I Laboratory (four semesters)

### **Open House Events**

Held open house events and gave presentation on Image Processing Research to prospective students, families, and the public at various open house events

### **Prospective Students**

Received prospective students, had them for class visit, lab tours, etc.

### **Faculty Mentorship for Incoming Students**

Interaction with incoming students at the university to explain faculty/student expectation, plans for achieving success, civility in the classroom etc.

### **Undergraduate Research Conferences**

Served as a judge at the oral presentation during 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup>, and 9<sup>th</sup> Annual Undergraduate Research Conferences, 2006, 2007, 2008, 2009, 2010, 2011, 2012, & 2013 Missouri S&T

### **Communication Workshops**

Judged graduate students in the communication workshops for possible recruitment as Graduate Teaching Assistants at the department.

### **Ph.D. Qualifying Exam**

Served as a question setter and examiner for the Departmental Ph.D. Qualifying Examination in Electrical and Computer Engineering - 2004, 2005, 2006, 2007, 2009, 2010, 2011, 2012, 2013

### **Search Committees**

Served as a Member in three Faculty Recruiting Committees: Aug 2009 – Jan 2010

### **Other Scholarly activities**

**Presented paper in the ASEE 2012 Midwest Section Conference**

### **ASEE Proceeding**

*“Learning by engagement and empowerment – a pragmatic approach to enhance student in a service course and developing relevance of such a course to their own majors”*– B. Shrestha, 2012 Midwest Section Conference, American Society for Engineering Education (Innovative teaching philosophy)

Served as a section chair in the ASEE 2012 Midwest Section Conference

Attended various Ed-Tech seminars at S&T

Served as a representative in the following S&T executive committees

Academic Freedom Committee, Global Studies Committee

### **Honors and Awards**

Fulbright Scholar

Alpha Nu Sigma, National Nuclear Engineering Honor Society

Sigma Pi Sigma, National Physics Honor Society

Tau Beta Pi, National Engineering Honor Society

Phi Kappa Phi, Honor Society for All Academic Disciplines

Outstanding Research Award

Selected for biography in Marquis’ ‘Who’s Who in Science and Engineering in U.S.A.’

### **Scientific and Professional Societies**

ANS, American Nuclear Society

APS, American Physical Society

NPS, Nepal Physical Society

AMS, American Mathematical Society

Sigma Xi, The Scientific Research Society of America

ASEE, American Society of Engineering Educators

Senior member, IEEE, Institute of Electrical and Electronics Engineering

### **Research area of interest**

Algorithm development for feature extraction towards helping diagnose cancerous lesions, signal and image processing, statistical physics, particle transport, radiation shielding, Monte Carlo techniques, stochastic events, Markov chain models, simulation of physical processes, optimization techniques.

### **U.S. Patent**

Automatic Detection of Critical Dermoscopy Features for Malignant Melanoma Diagnosis – U.S. Patent # 7,689,016 received March 30, 2010, co-inventor.

### **Funded Research**

Co-Investigator – “Automatic Detection of Critical Dermoscopy Features for Melanoma Diagnosis” – National Institutes of Health, National Cancer Institute, \$999,202, Grant Number 5R44CA101639-03 2007/2008 – Completed

### **Selected Peer-reviewed publications**

M. E. Bresnahan and **B. Shrestha**, “Potential shielding for a positron emission tomography (PET) suite” - Journal of Biomedical Graphics and Computing, June 2012, Vol. 2, No. 1

A. Dalal, R.H. Moss, R.J. Stanley, W.V. Stoecker, K. Gupta, D. A. Calcara, J. Xu, **B. Shrestha**, R. Drugge, J.M. Malters, L.A. Perry, “Concentric Decile Segmentation of White and Hypopigmented Areas in Dermoscopy Images of Skin Lesions Allows Discrimination of Malignant Melanoma,” *Computerized Medical Imaging and Graphics*, 35(2011) 148-154.

W.V. Stoecker, M. Wronkiewicz, R. Chowdhury, R. J. Stanley, J. Xu, A. Bangert, **B. Shrestha**, D. A. Calcara, H. S. Rabinovitz, M. Olivero, F. Ahmed, L. A. Perry, R. Drugge, “Detection of Granularity in Dermoscopy Images of Malignant Melanoma Using Color and Texture Features,” *Computerized Medical Imaging and Graphics*, 35(2011) 144-147

**B. Shrestha**, J. Bishop, K. Kam, X. Chen, R.H. Moss, W.V. Stoecker, S. Umbaugh, R. J. Stanley, M. E. Celebi, A.A. Mahrqoob, G. Argenziano, H.P. Soyer, “Detection of atypical texture features in early malignant melanoma,” *Skin Research and Technology*, 2010; 16: 60-65

W.V. Stoecker, K. Gupta, **B. Shrestha**, M. Wronkiewicz, R. Chowdhury, R. J. Stanley, J. Xu, R.H. Moss, M. E. Celebi, H. S. Rabinovitz, M. Oliviero, J. M. Malters, I. Kolm, “Detection of basal cell carcinoma using color and histogram measures of semitranslucent areas,” *Skin Research and Technology*, 2009; 15: 283-287

W.V. Stoecker, K. Gupta, R. J. Stanley, R.H. Moss, **B. Shrestha**, “Detection of asymmetric blotches (asymmetric Structureless areas) in dermoscopy images of malignant melanoma using relative color,” *Skin Research and Technology*, 2005; 11: 179-184

### **Selected relevant publications**

W.V. Stoecker, S. Stricklin, E. Black, R.H. Moss, R.J. Stanley, **B. Shrestha**. “Skin Scan Digital Dermoscopy Skin Cancer Training Software,” Life Science Conference, University of Missouri Kansas City, 2010.

W.V. Stoecker , R.J. Stanley, A. Khan, R.H. Moss, **B. Shrestha**. “Fuzzy Logic Applied to Discrimination of Melanoma in situ vs. Dysplastic Nevi.,” *Dermatology* 2006; 212:294-295.

X. Chen, R. H. Moss, W.V. Stoecker, S. E. Umbaugh, R. J. Stanley, **B. Shrestha**, “A Watershed-based Approach to Skin Lesion Border Segmentation”, Poster P-275 6<sup>th</sup> World Congress on Melanoma, Vancouver, Canada, Sep 6-10, 2005

X. Chen, R. H. Moss, W.V. Stoecker, T. Lee, R. J. Stanley, **B. Shrestha**, D. McLean “Software Improvements in Hair Detection using Dull razor”, Poster P-238 6<sup>th</sup> World Congress on Melanoma, Vancouver, Canada, Sep 6-10, 2005

**B. Shrestha** and A. Shrestha, “Monte Carlo Simulation of Photon Transport in an Egg in a Postulated Irradiation Procedure,” *Jour. Rad. Prot. Mgmt.*, 1999, 16: 35-40.

N. Tsoulfanidis and **B. Shrestha**, "Photon Dose Equivalent Rate from a Cylindrical Source using a Point Kernel Technique," *Jour. Health Physics*, 1997, 722: 931-935.

N. Tsoulfanidis and **B. Shrestha**, "Geometry Factors used for the Calculation of Gamma Dose received by Various Organs of a Human Phantom," *Jour. Rad. Prot. Mgmt.*, 1995, 12: 56-66.

**B. Shrestha** and N. Tsoulfanidis, "Gamma Dose received by Internal Organs and the Fetus from External Gamma Sources, Calculated with the MCNP Code," *Jour. Rad. Prot. Mgmt.*, 1995, 12: 21-40.

N. Tsoulfanidis and **B. Shrestha**, "Gamma Dose from a Cylindrical Source Obtained by Point Kernel and MCNP", *Trans. Amer. Nuclear Society*, 1994, TANSO 71: 411.

### **Invited presentations**

"Dermvis Engine: A systems approach in lesion analysis" in the Second Quadrennial Cutaneous S&T Imaging Conference, August 26, 2009, Missouri S&T

"Texture" in the Symposium on Automatic Detection of Malignant Melanoma Using Image Processing, July 13, 2005, University of Missouri-Rolla

### **Research Committees**

#### **Ph.D. Students**

Nabin Mishra "Use of APN in melanoma classification" ongoing, 2014

Amol Patil, "Characterization of Radiation Detectors based on Detector Dead-time, Paralysis Factor and Fano Factor in very High Radiation Environments," Department of Mining and Nuclear Engineering, Missouri S&T, Dec 2009

Xiaohe Chen, "Automatic Detection of Lesion Border and Edge-Related Structures in Dermoscopy images," Department of Electrical and Computer Engineering, University of Missouri-Rolla, August 2007

#### **M.S. Students**

Venkata Sai Narasimha Kaushik Ghantasala "Feature Extraction through Median-Split Algorithm Segmentation for Melanoma Detection" Department of Electrical and Computer Engineering, Missouri S&T, Oct. 2013

Saurabh G. Karnik "Automatic Detection of Polypoid Skin Lesions: The Squash Sign" Department of Electrical and Computer Engineering, Missouri S&T, Feb. 2013

Lakshmi Sindhu Meka "White area analysis for Detection of Malignant Melanoma" Department of Electrical and Computer Engineering, Missouri S&T, March 2012

Deepika K. Timmavajjula, "Target Detection and Feature Evaluation for Air-Borne Minefield Target Images," Department of Electrical and Computer Engineering, Missouri S&T, Dec. 2009

Ankur Dalal, "Automatic Detection of White Areas in Dermoscopy Images," Department of Electrical and Computer Engineering, Missouri S&T, Dec. 2008

Sruthi C. Bhavanam, "Automatic Detection of Atypical Pigment Network Using Texture Segmentation," Department of Electrical and Computer Engineering, Missouri S&T, Dec. 2008

Shilpa Pendyala, "Texture Measurement of Semitranslucent areas in Basal Cell Carcinoma," Department of Electrical and Computer Engineering, Missouri S&T, Dec. 2008

Nishant Nepal, "Detection of Annular Granular Melanoma in Situ," Department of Electrical and Computer Engineering, University of Missouri-Rolla, May 2007

Pavani Jella, "Pigment Network Extraction and Salient Point Analysis," Department of Electrical and Computer Engineering, University of Missouri-Rolla, May 2004

Saravanan Ranganathan, "Texture Analysis of Skin Tumor Images," Department of Electrical and Computer Engineering, University of Missouri-Rolla, May 2002

**OURE (Opportunities for Undergraduate Research Experience) Research Students**

Vincent Allen, Wenyu Zhou, Kathryn Isbell "Inference Engine for Skin cancer Diagnosis" (2012/2013) – went to the capitol to present research report to the lawmakers

Emily Kackley and Robert Stamm, "Spectral Analysis of Basal Cell Carcinoma," Department of Electrical and Computer Engineering, Missouri S&T, 2010

David Madsen, Jedidiah Hobbs, and Joshua Williams, "Web Accessible Pharmaceutical Database," Department of Electrical and Computer Engineering, Missouri S&T, 2010

Bryce Schumacher and Kenneth Bassler, "Milia-like cysts," Department of Electrical and Computer Engineering, Missouri S&T, 2010

Cory Gassner, "Automating the Detection of Atypical Pigment Network Using Texture Segmentation," Department of Electrical and Computer Engineering, Missouri S&T, 2009

Michael Nolte, Leykun Amdemichael, Adedayo Agbaje, Timothy Ryan Wilkins "Detecting and Analyzing Milia-Like Cysts for Diagnosis of malignant Melanoma," Department of Electrical and Computer Engineering, Missouri S&T, 2008

Foo S. Phat, "Post-Processing of Automated Border Detection Software for Skin Images," Department of Electrical and Computer Engineering, Missouri S&T, 2008

Shao-Yu Chou, "Skin Lesions Texture Feature and Analysis," Department of Electrical and Computer Engineering, University of Missouri-Rolla, 2007

David Mendoza, "Texture Feature Data Extraction," Department of Electrical and Computer Engineering, University of Missouri-Rolla, 2006

Keong Kam, "Texture Analysis of Skin Cancer Images: Segmentation Methods," Department of Electrical and Computer Engineering, University of Missouri-Rolla, 2006

Joe Bishop, "Texture Feature Extraction," Department of Electrical and Computer Engineering, University of Missouri-Rolla, 2006

Joseph Montgomery, "Texture Feature Extraction," Department of Electrical and Computer Engineering, University of Missouri-Rolla, 2005

Rahul Kothari, "Establishing Communication with Nikon Coolpix 950 Camera," Department of Electrical and Computer Engineering, University of Missouri-Rolla, 2004