

# Curriculum Vitae

Nikolay  
First name

Metodiev  
Middle name

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Surname

## Affiliation and Official Address:

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## Education: (degrees, dates, universities)

*Ph.D. degree:* 1988-1991; Center of Mathematics, Comp. Science & Mechanics-Bulgarian Academy of Sciences (BAS); in the field of Pattern Recognition-Title: 3D objects recognition by help of regularities, order and set of identification. *Defended in 1991.* The work was developed under international project dedicated to develop a robot system capable of nuclear reactors inspection.

*Master degree-*1982-1983; Sofia University (SU)- School of Mathematics & Computer Science, in the field of Coding Theory, Title: New examples of (15,11) systematical, non-vasiliev's, non-linear, perfect codes correcting one error, *defended 1983.*

*B.S-*1978-1982, Sofia University (SU) "Kl. Ohridsky"- School of Mathematics & Computer Science, *the top Math and Informatics Dept. in the country, the top School in the country.*

In the army: September 1976 – October 1978.

Bulgarian National High School of Math and Informatics "Lubomir Chakalov", 1973-1976, *the top High School in the country.*

## Career/Employment: (employers, positions and dates)

Texas A&M University Commerce, Dept CSIS, Dept of Math– Professor 2015-present

Associate Prof. 2010-2015;

Assistant Prof. 2004-2010

Northern Arizona University- US– Dept. Math & Statistics 2001- 2004;

Institute of Mechanics and Biomechanics- BAS - Associate Professor 1999 –2001;

Instituto Superior Tecnico, Lisbon, Portugal- Senior Researcher, Invited Professor 1998-1999, 2000

Scientific Chair of Biomechanics and Telemanipulators Lab. 1996-1998;

Transport University - Invited Associated Professor 1995-1997;

Institute of Mechanics – BAS - Research Fellow I degree (RF I), 1992-1999;

Int. Lab of Artificial Intelligence – Slovak Academy of Sciences - RF I 1991

Technical University Sofia - Invited Assistant Professor 1988-1990;

Center of Mathematics, Comp. Sc. & Mechanics- BAS –RF III – I degree, 1985-1990.

## Teaching Experience And Service

*RECORD OF COURSES TAUGHT:* Math and Computer Science

*US EXPERIENCE, 2001-Present:*

📖 Texas A&M University Commerce

Recipient Excellence teaching Award: in Spring 2010, 2011

**Lectures: Fall 2004 – present; total # of students - 2233; Graduate – 1325.**

**Graduate:** Image Processing with Applications CSCI567/Math563; Image Analysis with Recognition CSCI569/Math597; Numerical Analysis Math546/CSCI546; Machine Architecture Assembly Lang CSCI516; Algorithms Design CSCI532.

**Undergrad:** Calculus III Math314; Differential Equations Math315; Discrete Mathematics Math331; Numerical Analysis Math317; Linear Algebra Math335; Calculus II and I; Pre-calculus.

## **Lectures:**

### **Fall 2016:**

**Math 546 Numerical Analysis- Televised Class**– 6 students Main Campus, 3- Metroplex.; **CSCI569 Image Analysis with Recognition** – 10 students Main campus.

**Math597 Image Analysis with Recognition Televised** – 3 students Metroplex. **CSCI516** – 10 students

### **Spring 2016:**

*Dept. CSIS-* **CSCI516 03E- Comp. Org. and Assembly Lang** –Graduate class- **32 students**

**CSCI 567/Math563** – Image Processing with Applications Graduate – **30 CS + 8**

**Dept. Mathematics – Math317 Numerical Analysis – 19 students**

**Chetana Divakar** -CS-Chair of Master Defense Committee– **Title-** Tracking objects in video with SIFT and Active Contour, expected defense April 15, 2016.

**Math595**, He Zhang, Title: SVM from Binary to Multi-Class, Defended on June 29, 2016.

**Fall 2015:** **CSCI516** – 35 students , **CSCI569 Image Analysis with Recognition**– **11 students**,

**CSCI518**-Thesis class – Chetana- Tracking multiple objects with occlusions.

**Math 315**, DE- **15 students**; **Math546 Numerical Analysis** – **6 students**.

### **Spring 2015:**

*Dept. CSIS-* **CSCI516 02E- Comp. Org. and Assembly Lang** –Graduate class- **34 students**

**CSCI516 03E-Comp. Org. and Assembly Lang** –Graduate class- **40 students**

**CSCI 567** – Image Processing with Applications Graduate – **3 students**

**Dept. Mathematics – Math317 Numerical Analysis – 13 students**

**Math563** – Image Processing with Applications Graduate – **5 student**

**Master Thesis CSCI518:** Swathi Mugapala, **Title:** Tracking Fully Occluded Objects.,

**Fall 2014:** *Discrete Math331* – **22 students**;

*CSCI569 Image Analysis with Recognition*- **7 students**;

*Math546 Numerical Analysis* – **5 students**;

**Summer II, 2014** – Calc. III Math314 -12 students

### **Spring 2014:**

**Math Comp Exams:** 2 Math546 NA, 1 Math 597 Image Analysis, 1 Math 563 Image Processing

*Dept. CSIS-* **CSCI595 - Research & Literature** –Graduate class- **14 students**

**CSCI595 - Research & Literature** –Independent – **1 student**

**CSCI 567** – Image Processing with Applications Graduate – **9 students**

**CSCI 497** – Introduction to Image Processing – **6 students for time release**

**Dept. Mathematics – Math335 Linear Algebra – 34 students**

**Math563** – Image Processing with Applications Graduate – **1 student**

**Master Thesis Math518:** Adam Bowden, **Title-** Implementation of the Schrodinger Partial Differential Equation for Image Segmentation.

**Fall 2013- New Course Developed:** CSCI569 Image Analysis with Recognition

**Fall 2013:** **CSCI 569 Image Analysis with Recognition** – 7 students, **CSCI546/Math546 Numerical Analysis** – 4 students, **Math317 Numerical Analysis** – 13 Students; **CSCI 589** – Circularity and Solidity Calculation for Skin Lesion diagnosis- 1 Student; **CSCI – 595** – Skin Lesion Texture Extraction-1 Student; **CSCI-595 - Boundary And Convex Hull Extraction Of Multiple Objects-1 Student**, **Math518** – Implementation of the Schrodinger Partial Differential Equation for Image Segmentation.

**Summer II, 2013** - Calc. III, Math 314, 10 students

**Development of new course Math597/CSCI546 Numerical Analysis**

**Spring 2013: Comprehensive Exam, for Math563 -3, NA-Math597-2**

*Dept CSIS-***CSCI-516 Fund Concepts Computing/Mach Org** –Graduate course, **19 students**

**-Master Thesis CSCI518:** P. KANDHARE, Object Tracking In Video Sequence Using Modified Kalman Filter With A Shrinking Active Contour As A Measuring Tool, Master Degree Thesis, Dept. of Computer Science, Texas A&M University-Commerce, Defense April 18, 2013.

**-Math595** – Binbuhaer, A – Solution of the Poisson PDE with Finite Differences & Element Methods,

**-Math595** – Manal Alabdulhadi – Estimating Sample Size and Confidence Intervals,

*Dept of Math* – **Math-331** Discrete mathematics, **33 students**,

Image Processing with applications – **CSCI567-9 students; Math563- 2, Math489 - 1 students**

## **Fall 2012**

*Dept. CSIS-CSCI516* Fund Concepts Computing/Mach Organization – Graduate course,

**CSCI518** Thesis, 1 student- Pravin Kandhare, **Title:** Tracking objects in video

*Dept of Math* – **Math-597/** CSCI546 Numerical Analysis – **6 students, new course**

**Math 317** – Numerical Analysis- **18 students**

## **Summer II 2012** ,Comprehensive Exam

Dept. of Mathematics- Math 314, Calculus III, - **18 students** ;

Math589 – Independent Study, Pravin Kandhare, Title: Advanced Image Analysis with Elements of Recognition;

Math489 – Rebecca Stewart, Title: Optimal Path Detection in Graphs

CSCI589- Sheena Mathew - Title: Experimental Validation of Integral Scaling Algorithms.

## **Spring 2012:** Comprehensive Exam, for Math563

*Dept. CSIS-CSCI-516* Fund Concepts Computing/Mach Organization – Graduate course, 24 students

**CSCI518** Thesis, 1 student- Pravin Kandhare, **Title:** Tracking objects in video sequences

**CSCI589** – Independent Study, Sheena Mathew, Title: Radial Integral Technique for Scale Invariant Image Region Matching.

**Math589** – Independent Study, Pravin Kandhare, Title: Image Analysis Methods

**Math595** - Project, Raghu Manur, Title: Software for Image Splitting using Delaunay Triangulation, we met on Feb. 03, 2012, I developed the method for him, provided John's Report , and

the software by Frigo in C++. This software differs from what is required in the image tessellation.

*Dept of Math* – **Math-331** Discrete mathematics, **35 students**,

Image Processing with applications – **CSCI567-1 students; Math563- 5, Math489 - 7 students**

Development of new course CSCI546 Numerical Analysis, Math546

## **Fall 2011**

*Dept CSIS-CSCI516* Fund Concepts Computing/Mach Organization – Graduate course, **32**

**CSCI595** – Automatic Skin Lesions Features Extraction with S-ACES active contour.

*Dept of Math* – **Math-314** Calculus III–Upper Level-course, **35 students**,

**Math 317** – Numerical Analysis-Upper Level - **13 students, Undergraduate.**

**Math589**-Independent Study – **2** Master Students, **Title:** Integrals on Radial Lines for Scaling Invariant Regions Matching: **Title:** Delaunay Triangulations and Voronoi Diagrams for splitting and merging images.

**Summer I, 2011-** Calculus III, Math 314 – **9 students;**

**Thesis** Chakrader Nara, **Title:** Active contour on the exact solution of the active convex Hull Model Working with noise, published; Math 589 – Sheena Mathew, **Title:** Circular and Radial Techniques for Rotational and Scale Invariant Regions Matching;

## **Spring 2011:**

*Dept CSIS-CSCI-516* Fund Concepts Computing/Mach Organization – Graduate course, section 1 - **46, section 2- 39 students;**

CSCI518 Thesis, 1 student- Chakrader Nara, **Title:** Active contour on the Exact solution of the active convex Hull Model Working with noise

*Dept of Math* – **Math-335** Linear Algebra, **32 students**,

Image Processing with applications – **CSCI567/Math563/ Math489 - 11 students,**

**Fall 2010**

*Dept CSIS-CSCI-516* Fund Concepts Computing/Mach Organization –Graduate course, section 1 - 28, section 2- **18 students**, the latest edition of the text buck is used;

CSCI595 Research & Literature – Graduate- 1 student

CSCI518 Thesis, 1 student- Chakrader Nara, **Title:**

*Dept of Math –Math-315* Differential Equations–Upper Level-course, 32 **students,**

**Math** – Numerical Analysis-Upper Level - **13 students, Undergraduate.**

Math589-Indipendant Study – **1** Master Student, **Title:** Scaling, Rotation and Translation Invariant Region Matching Methods.

**Summer 2010** - Dept. of Mathematics- Math 314, Calculus III, - **15 students;**

Math589-Indipendant Study – **1** Master Student, **Title:** Correlation and Shape Matching Methodology;

Dept. of Comp. Science- CSCI532-Algorithms Design- **20 students.** *The course is Web Enhanced.*

**Spring 2010:** *Comprehensive Exam*, April 15, for CS-

*Comprehensive Exam*, February 15, 2010, Math- **1 master students.**

**Spring 2010** Dept. of Mathematics- Math 314, Calculus III – **6 students;**

*Dept CSIS-CSCI-516* Fund Concepts Computing/Mach Organization –Graduate course, section 1 -**40**, section 2-**28 students**, the latest edition of the text buck is used;

**Master Thesis-** Karthik Ushkala- Tracking Objects-**1 Graduate student;**

**Fall 2009:** *Comprehensive Exam*, October 2009, for Math- **1 master students.**

Dept. of Mathematics- Math 315, Differential Equations - **35 students;**

*Dept CSIS-CSCI-516* Fund Concepts Computing/Mach Organization –Graduate course, section 1 -**25**, section 2-**22 students**, the latest edition of the text buck is used;

**CSCI589-** Image Segmentation and Analysis, **1 Graduate student;**

**CSCI595-** 3 projects for **3 graduate students.**

**Summer 2009**

*Comprehensive Exam*, June 2009, for Math- **2 master students.**

Dept. of Math- Math 314, Calc III, - **16 students;** Math589-Indipendant Study – **1 Master Student;**

Dept. of Comp. Science- CSCI532-Algorithms Design- **5 students.** *The course is Web Enhanced.*

**SPRING 2009**

*Dept CSIS-CSCI-516* Fund Concepts Computing/Mach Organization –Graduate course, section 1 -**36**, section 2-**26 students**, the latest edition of the text buck is used;

**CSCI-567** Image Processing w/Applications -Grad-course, **12 student;**

**CSCI489-**Imame Processing with Applications Hours: 1-4, **1 Undergraduate**

*Dept of Math –Math-563* Image Processing w/Applications–Grad-course, **05 students,**

**Math 489-**Introduction to Partial Diff Equation Hours: 1-4, **1 Undergraduate.**

**FALL 2008:**

**Comprehensive Grad Exam CS** – **around 50 students;**

**Comprehensive Grad Exam Math- Fall 2005-2007, 1 student.**

*Dept CSIS-CSCI-516* Fund Concepts Computing/Mach Organization –Graduate course, section 1 -**46**, section 2-**40 students**, the latest edition of the text buck is used;

**CSCI532, Algorithms Design- 28, +7 extra, graduate students; CSCI595- 9 students;**

*Dept of Math – Math-191* –Calc. I- **25 students, Bin 302;**

**SUMMER II 2008:**

Dept Math - Linear Algebra Math 335 – **29 students.**

Continuation of **Math 589**.

**SUMMER I 2008:**

*Dept CSIS-CSCI532- 35 graduate students, Session I;*

*Dept Math-Math314-Calculus III- 17 students Session I;*

**Math 589**- Title: Search optimization in image database, Session I and Session II-one student  
Shrinivas Komu, 50001262, CS graduate

**SPRING 2008:**

*Dept CSIS-CSCI-516 Fund Concepts Computing/Mach Organization –Graduate course, section 001, 21633-37 students, Jour 129;*

**CSCI-567** Image Processing w/Applications -Grad-course, **16 student;**

*Dept of Math – Math-192 –Calc. II,- 40 students;*

**Math-563** Image Processing w/Applications–Grad-course, **22 students**, the latest edition of the text book is used.

**FALL 2007:**

**Comprehensive Exam CS – 14 students; Comprehensive Exam Math- 5 students.**

*Dept CSCI-CSCI-516 Fund Concepts Computing/Mach Organization –Graduate course, Spring-2007, section 001, 81695-32 students; section 002, 82599 -29 students;*

**CSCI595** Research & Literature, Graduate Course– **5 students.**

*Dept of Math – Math-142 Pre-Calc, Spring 2007- 26 students, BA 257;*

**Math-314** Calc. III, Spring 2007- **27 students, Bin 302**

**SUMMER I, 2007:**

*Dept CSCI Algorithms Design, CSCI532 – Graduate Course, 16 Students, Jour 104*

*Algorithms Design, CSCI489 – Undergraduate, 1 Student*

**SPRING 2007:**

*Dept CSIS-CSCI-516 Fund Concepts Computing/Mach Organization –Graduate course, Spring-2007, section 001, 21633-34 students, 3-4:15PM, Jour 129; section 002, 22074 -35 students, 12:30PM-1:45PM, Jour 129;*

**CSCI-597** Image Processing w/Applications -Grad-course, Spring 2007 – **3 student;**

*Dept of Math – Math-142 Pre-Calc, Spring 2007- 41 students, Bin 301, 11-12:15PM;*

**Math-597** Image Processing w/Applications–Grad-course, Spring 2007- **7 students, Science 123,** 7:20-10PM;

**Math-489** Image Processing w/Applications – Under Grad-Spring 2007 – **1 student;**

**FALL 2006:**

*Dept CSIS-CSCI-516 Fund Concepts Computing/Mach Organization –Graduate course, two section 42 students each, total 84 students; CSCI-595 Research Lit & Tech. – 13 student;*

*Dept of Math – Math-191 Calc I, - 26 students; Discrete Math 331 – 25 students.*

**SPRING 2006:**

*Dept CSIS-CSCI-516 Fund Concepts Computing/Mach Organization –Spring-2006-33 students;*

**CSCI322** Computer Organization – *9 students;*

**CSCI-597** Image Processing w/Applications -Grad-course, Spring 2006 – *6 student;*

*Dept of Math – Math-191 Calc I, Spring 2006- 27 students;*

**Math-597** Image Processing w/Applications –Grad-course, Spring 2006- *8 students;*

**Math-489** Image Processing w/Applications – Under Grad-Spring 2006 – *1 student;*

**SUMMER 2006: Math-252** Calc III, - *10 students.*

**FALL 2005:**

*Dept CSIS-CSCI-516 Fund Concepts Computing/Mach Org –Grad-course, TWO SECTIONS 32 students each, Total 64;*

Dept CSIS - **CSCI-595** Research Lit & Techniques – Fall2004-Fall 2005, 10 students;

Dept of Math – **Math- 315** Differential Equations, Upper Level Under Grad; 31 students;

Math- 142 Pre-calculus, 34 students;

**SUMMER 2005:** Math 335, Linear Algebra, 12 students.

**SPRING 2005:**

Dept CSIS-**CSCI-516** Fund Concepts Computing/Mach Org; 39 students;

Dept of Math – **Math-191** Calc I, 27 students;

**CSCI-597, Math-489, Math-597** Image Processing w/Applications; 15 students.

**FALL 2004 :** Dept of Math – **Math-192** Calc II, Math 225 Calc III, total 35 students.

**Supervising Master Thesis 2011-2016** - 5 successfully defended in the fields of: Active Contours - 1; Active Contours and Features Extraction-1; Tracking objects with partial and/or full occlusion -3.

*Publications with Master students:* 2 peer reviewed Journal papers; 2 peer reviewed top 1% CS Symposiums posted by IEEE Xplore.


### **Supervising PhD Research and PhD Committees:**


1. University of Alabama at Birmingham – Ph.D. research advisor to the student Pravin Kandhare, in the field of Tracking Multiple Targets with Multiple Cameras.  
*Publications:* 1 Journal paper.
2. Indian Institute of Engineering Science and Technology, West Bengal, India, 2016, Ph.D. student Oishila Bandyopadhyay, I was a member of her Ph.D. Committee, *Subject:* Automated Analysis of Orthopaedic X-ray Images.
3. University of Paris 13, France- 2012-2013, Ph.D. student Thieu Tung, I was a member of his Ph.D. Committee, *Subject:* Convex Active Contours.  
*Publications:* 1 Journal paper with Impact Factor, 1 peer reviewed symposium paper.
4. Instituto Superior Tecnico- Lisbon Portugal – 1999-2000- Ph.D. student Izabel Granado, I was a Co-supervisor of Dr. Fernando Muge, *Subject:* Mathematical Morphology, Image segmentation, 3D reconstruction.  
*Publications:* 1 Journal paper with Impact Factor, 1 peer reviewed symposium paper;


### **Northern Arizona University – Dep. Math & Statistics:**

- Summer 2004-Fall 2001 – Finite Math, Differential Equations and Numerical Methods, Calculus– total around 88 credit hours;
- *The students' written evaluations, of my teaching techniques, are above average for Northern Arizona University;*


*European Experience, in Computer Science:*

 School of Mathematics and Computer Science, Sofia University, *graduate students*, spring 2001:  
- Modeling, Reconstruction, Visualization and Manipulation of 2D/3D objects;

 CVRM-Instituto Superior Tecnico (IST) – Lisbon, Portugal, *Master and Ph.D. students*, 1998-2000.  
- Introduction to 3D modeling and visualization technology-C++ implementation.

 Institute of Mechanics (IM)- Bulgarian Academy of Sciences (BAS), *Graduate Students*-1995-1998:  
2D/3D objects description, modeling, reconstruction and visualization – C++ implementation; 2D/3D Computer graphics; Image Processing; Pattern recognition; Coding Theory; Microcomputers and assembler language.

*In Applied Math*

 Transport University Sofia, Dep. of Math and CS, *Undergraduate students* - 1995 –1997:

Computational geometry; Numerical methods and linear programming.

📖 Technical University Sofia, Department of Applied Math, *Undergraduate students*, 1987-1990: Discrete math; Numerical Methods- implementation by FORTRAN; Intro to Optimization.

### **SUPERVISING UNDERGRADUATE STUDENTS' RESEARCH IN THE US:**

**NSF-REU program** Dept. Chemistry June 04,2007-August 10,2007- one student researcher Reubin Hinman, Project “Enhancement and Features Extraction from Surface Images.”, 3 seminars, during the program, one final presentation.

**At NAU under REU Program, sponsored by NSF-2003-2004.**

**PROJECTS:** <http://odin.math.nau.edu/reuprojects.html>

Title: 3D Edge Detection and Visualization based on the Geometric Heat Equation, 2004,  
Student researcher Anthony DiPietro, Depts. Mathematics\Computer Science, Grove City College. *The work was funded for presentation on the Young Mathematicians Conference, Ohio State University, August 19-22.2004;*

Title: A Method for Rapid Edge Detection and Image Segmentation, 2004; Student researcher Michael Wells, Dept. of Mathematics, Rice University.

Title: An Application of Differential Equations to Image Processing, together Catherin Lichten *McGill University, 2003;*

Title: Objects Detection in an Image Database Using Shape Features, together with Andrey Kislauk, *University of California Berkley.*

### **SUPERVISING Undergraduate Students in the US:**

1. *Rebecca Steward* – Dept. of Mathematics – Graph Theory, summer **2011**.
2. *Rohan Narain*, Undergrad student CS Dept, *Project: Content Based Image Retrieval Systems. 3D objects reconstruction and visualization, Spring 2005, Spring 2008.* Title: Features used in 3D indexing and retrieval;
  - Given on Campus poster presentation -*Students Research Symposium 10.22.05;*
  - Given presentation for the *Pathway Young Research* meeting in Kingsville-November 03-05.2005;
  - A poster presentation for the Pathway Undergraduate Symposium – Prairie View Texas A&M Univ, Nov 10-11,2006, **Best CS presentation award;**
  - A poster presentation on the Pathway symposium, **Nov. 03,2007;**
  - Presentation to the TAMUC Annual Research Symposium 2008, Thursday April 24, 2008; Title: Image semantics for indexing of large image databases. **Best undergraduate presentation –award;**
3. Will Harrell, Undergraduate student CS Dept, Title: 3D visualization from 2D cross sections, **Fall 2007.**
4. Bohannon, Derek, Undergraduate student CS Dept, an introduction to 3D visualization, **Fall 2006;**
5. Minh Tang (SID-342-65-988), Undergraduate student CS Department, *Project: coding the Convex Hull algorithm to Image Database Indexing, C++ , Fall 2005, Spring 2006;*
6. *Nathaniel Rowland-* Undergrad student CS Dept, C++ tool to implement a new Convex Hull Model based on the Geometric Heat Differential Equation, *funded by the Dean of College of Arts and Science under Undergraduate Student Research initiative, Spring 2005.* The submitted report was highly evaluated by the Dean of Arts and Science;
7. Mr. Christopher Rex- Boundary support and its applications, funded by the Dean of College of Arts and Science under Undergrad Student Research initiative, **Fall 2004.**

### **SUPERVISING GRADUATE RESEARCH in the US:**

1. **Chetana Nimmakayala**-Dept. CS –Tracking Multiple Objects with Occlusions-**2015-2016;**
2. **Dheeraj Maddanagary**-CS- Parallel search in general graphs using GPU- Spring **2015.**
3. **Swathi Munagala**- Dept. CS – Tracking Multiple objects, - Since Spring **2014-2015;**
4. **Adam Bowden** – Dept. of Mathematics – Active Contours on Partial Differential Equation, **Master Thesis, May 2014, American Institute of Physics paper,**
5. **Pravin Kandhare** – Dept. of Computer Science – Tracking Objects in a Video, **Master Thesis April 2013, Journal paper Published,** Fall 2011- Spring 2014 .

6. **Melendez, John M.** - Grad Student Dept. Math.- **Title:** Image Segmentation Using Delaunay Triangulation with a Predicate, Preparing a presentation for the Texas meeting of the Mathematical Association of America, April 2012.
7. **Sheena Mathew** – Dept. of CS. Region Matching of Objects using Scaling and Rotational Invariant Methods, Participation at the TAMUC Res. Sym.-April, TAMU-Pathway, 11, **2011.**
8. **Surendra Chakrader Nara** – Dept CS, Image Enhancement, Active Contours evolving on noise images, **Awards :** 2<sup>nd</sup> place Annual Research Symposium Texas A&M Commerce; 8th Annual Texas A&M University-System Pathways Research Symposium, West Texas A&M University, October 22-23,2010, **Master’s Level, 2nd Place, CS, Title:** Enhancement of Skin Lesion Images to Remove Noise. *Defended Master Thesis April 2010-* since 2009,
9. **Srikanth Sriram** – Skin Lesions Features Extraction, and masks generation. **2011.**
10. **Jandhyam, Venkata N.** – Dept. CS, Matching Image Regions, Image Correlation, **2010, Awards:** 8th Annual Texas A&M University-System Pathways Research Symposium, West Texas A&M University, October 22-23,2010, **Overall Winner, Master's Level, 2nd Place & 1st Place Winner Math** Discipline, **Title:** Correlation and Shape Matching Methods;
11. **Karthik Ushkala**, Dept. CS, Image Segmentation and Analysis, Coding in Java the Active Convex Hull Model based on the exact solution of the Heat Differential Equation, Active Contours, **Fall 2008- Fall 2010;**
12. **Santhus Karapathy** – Dept. of CS, Knowledge extraction from Image Databases, **Fall 2008-Fall2009;**
13. **Prathat Pollisetty:** - Dept. of CS, Completed and optimized the Java code of the Active Convex hull Model, Fall 2008;
14. **Kommu, Shrinivas** 50001262 – Web search and engines, for Content Based Image Retrieval. Google achievements, Spring-Summer 2007, 2D/3D Indexing **Fall2007, Spring Summer 2008;**
15. **Jason Moore**, 10056344, Graduate Student- Dept. of Mathematics, Gradient Methods to Image Enhancement, **Spring 2007;**
16. **Shah, Divyesh R.**, 40475793, Graduate Student – Computer Science, *Project:* Data fusion in intelligent systems, Web Archives, DICOM image formats, **Spring 2007;**
17. **Archana Chada** , 50001103, Graduate Student – Computer Science, *Project:* C++ coding of a new active convex hull model, **Spring 2007;**
18. **Sudheer Musini** – Graduate Student CS Department– in the development of the NSF-CAREER proposal, summer 2006;

#### ***Supervising Master and Ph.D. students in Europe:***

- 3D visualization of bioorganic structures, School of Math and CS-SU, Summer 2002.
- 2D/3D visualization of multiple subsurface objects – modeling and interpolation, Image Analysis LAB (IAL) of CVRM-Instituto Superior Tecnico (IST)–Lisbon, Portugal, 1998-2000;
- 3D visualization. Shape from shading. IM-BAS, Technical University (TU) Sofia, Image Processing and Recognition Lab (IPRL), 1998;
- Virtual and Multimedia Libraries – architecture, content processing, TU-IPRG, 2000.
- Image Processing – objects partitioning, edge detection, image enhancement, IM-BAS and School of Math and CS –Sofia University, 1996-1998;
- 2D/3D visualization, modeling and reconstruction, IM–BAS and FMI-SU, 1996-1998;
- 2D/3D objects recognition approach to robot orientation in Power Nuclear Reactors, Center of Mathematics CS & Mechanics –BAS, School of Math and CS –Sofia University, 1989-1991.

#### **DEPARTMENTAL, COLLAGE, UNIVERSITY SERVICE:**

*US EXPERIENCE, 2001- Present:*

#### **TAMUC-2004 present**

- ✓ Member of the University Graduate Council – **2016 present**
- ✓ Member of the University Research Creative Activities Committee – **2014-present;**



- ✓ Chair of the CoSEA Tenure and Promotion Committee – **2012-2014**;
- ✓ Research Enhancement projects review and evaluation – Spring **2014**;
- ✓ ABET, SACS – Reports development participation – **2013, 2015**,
- ✓ Main Events presentations- **2006-2015**,
- ✓ Junior Faculty Research Award –review and evaluation – Summer **2014**.
- ✓ Chair CS Department ad hoc committee for developing policies regarding CSCI 515, CSCI516 – Spring **2013**;
- ✓ Joint-TAMUC-TUS- Comp. Sci. Master Program Development **Fall 2012**;
- ✓ Memorandum for Cooperation between TAMUC & Technical University Sofia (TUS)- **2012**.
- ✓ Faculty Search Com. Dept. of Mathematics, Dept. of Literature & Languages, **2012, 2015**;
- ✓ Tenure and Promotion Committee CoSEA. **2011- 2014**.
- ✓ Defense committee for Math595 project, Aida, August 01, **2012**;
- ✓ Master Thesis Committee for Salih Turk – Spring 2012, defense June 06, **2012** ;
- ✓ Master Thesis Committee for Krishna Komandury - Spring 2012, defense June 06, **2012**.
- ✓ Dean of COSEA Search Committee, since April 20, **2011** from Math Dept;
- ✓ Task Committee for development of a Ph.D. Program in Comp Sci.–**2009**.
- ✓ CS Dept. Assessment Team – October 02, **2009-present**;
- ✓ Development Committee of the new CS- Professional Science Master’s degree in Computational Science – **February 19, 2009, May 2009**, weekly meetings;
- ✓ Defense Com. Master Thesis of P. Kotturu – CS Dept, “Visual Autonomous Robots”, **2009**.
- ✓ Judge for the Pathway students and Young Faculty presentation contest **November 7-8,2008**;
- ✓ Graduate School Representative at the Ph.D. defense of Nr. Campanaro, **Oct. 28, 2008**;
- ✓ Work with Dr. Kremisnki on enrolment of Bulgarian graduate student at Dept of Mathematics, Spring, Summer, **Fall 2008**;
- ✓ Work on the undergraduate program pamphlet of the CS Dept- **November 2008**.
- ✓ Advisory Committee of Caleb Grisham for his Math595 report- **August 01.2008**;
- ✓ Advisory Committee of Katsuhiko Iwao for his Math595 report- **August 07.2008**;
- ✓ Ad hoc Committee recruiting International students, **Fall 2007**.
- ✓ Independent Study Presentation Committee- Jeremy Gaime-Thursday, May 10, **2007**.
- ✓ Curriculum Committee – Computer Science Department;
- ✓ Undergraduate Research Committee- Department of Mathematics, **2006-2007**;
- ✓ Committee which initiated and ran TAMUC- 2005 Undergrad Summer Research Program.
- ✓ Proctor of the TMSCA content, January 29.**2005**.

*Development of a graduate course “Image Processing with Applications”, Dept of Math/CS-TAMU Commerce, **Fall 2004-2005**;*

*Undergraduate Research Development Committee- since **Fall 2004-Spring 2005**;*

*University Initiative Committee for development of Summer 2005 Undergraduate Research program- **Fall 2004-Summer 2005**.*

#### **NAU-2001-2004**

*Member of Discreet Math Textbook Selection Committee, Dept. Math and Stat, NAU, 2003;*

*Co-chair of the Modeling Team, Dept. Math and Stat, Northern Arizona University, 2001- 2004;*

*European Experience:*

*Development of a Graduate Course “Modeling and visualization of 3D subsurface objects”, for the new program of Instituto Superior Tecnico-Lisbon, Portugal, end of 2000.*

*Program Development Committee of Robotic and Biomedical Engineering Dep. - Southwest University, Blagoevgrad, Bulgaria, 1994.*

#### **RECORD OF SEMINARS and INVITED LECTURES-IN THE US, 2001-Present:**

##### **Talks at Professional Meetings and Conferences 2005 - present:**

**Title:** Inscribing Convex Polygons in Star-Shaped Objects, 18<sup>th</sup> International Workshop on Combinatorial Image Analysis, **19-22 June 2017**, Provdiv, Bulgaria.

**Title:** Shape Matching for Rigid Objects by Aligning Sequences Based on Boundary Change Points, 18<sup>th</sup> Inter. Workshop on Combinatorial Image Analysis, **19-22 June 2017**, Provdiv, Bulgaria.

- Title:** Mathematical Concepts with Image Analysis Applications, November 12-13, 2016, **Invited Speaker** at Lloyd Roeling UL Lafayette Mathematics Conference (organized annually since 1974), University of Louisiana at Lafayette.
- Title:** Partially Occluded Weapons Identification Through Partonomy, ADSA14, ALERT Center of Excellence at Department of Homeland Security, May 9-10, 2016, Northeast U, Boston, **Invited Speaker. Participation only by Invitation.**
- Title:** New Accurate Automated Melanoma Diagnosing Systems, IEEE-ICHI2015,Dallas,10.22,2015
- Title:** Identification of Partially Occluded Firearms Through Partonomy, **Invited Speaker:** SPIE 2015, Defense Security and Sensing, Automatic Target Recognition, Baltimore, **April 22, 2015.**
- Title:** Investigations into the Noise and Multiple Region Segmentation Abilities of Euler-Lagrange Poisson Active Contour, 9th Int. Conf. on Differential Eq. and Dynamic Systems, Special Session: Appl. of DE and DS to Science and Industry, **May 14, 2015**, speaker A. Dowden.
- Title:** Optimal Set Of Features For Accurate Skin Cancer Diagnosis, IEEE ICIP 2014, International Conference of Image Processing 2014, IEEE ICIP2014, Paris, **October 28-30, 2014;**
- Title:** Tracking Partially Occluded Objects With Centripetal Active Contour, 16th Inter. Workshop Combinatorial Image Analysis 2014, IWCIA2014, Brno-Czech Republic, **May 20-30, 2014,**
- Title:** From Shape to Threat: Exploiting the Convergence Between Visual and Conceptual Organization for Weapon Identification and Threat Assessment, *SPIE "Defense, Security and Sensing"*, April 30, 2013, **10:50AM-11:35AM** in Baltimore, MD, **Invited Speaker.**
- Title:** Skin Lesion Feature Vector Space with A Metric To Model Geometric Structures of Malignancy, 15<sup>th</sup> Int. Workshop on Combinatorial Image Analysis, UT Austin, 10.28-30, 2012.
- Title:** Local Global Fuzzy Gaussian Distribution Energy Minimization of a Convex Active Contour Model, 15<sup>th</sup> Int. Workshop on Combinatorial Image Analysis, UT Austin, 10,28-30, 2012.
- Title:** Mathematical Concepts with Image Analysis Applications, November 02-04, 2012, **Lloyd Roeling UL Lafayette Mathematics Conference** (organized annually since 1974), **University of Louisiana at Lafayette, Dept. of Mathematics, 1h Invited Talk.**
- Title:** Weapon Ontology Annotation Using Boundary Describing Sequences, IEEE SSIAl, Santa Fe, New Mexico, April 22-24, 2012
- Title:** Automatic Boundary Detection and Symmetry Calculation In Dermoscopy Images of Skin Lesions, Poster session 10:15AM-1PM, IEEE ICIP2011, Brussels, Belgium, Sep. 13, 2011.
- Title:** Integration of Low Level and Ontology Derived Features For Automatic Weapon Recognition and Identification. *SPIE Defense, Security, and Sensing-Automatic Target Recognition XXI*, 25 - 29 April 2011, Orlando, Florida,
- Title:** Automatic Object Identification Using Visual Low Level Feature Extraction and Ontological Knowledge, SDPS'2010- *Society for Design and Process Science*, Dallas, Texas, June 09, 5PM.
- Title:** Tracking Neutrophil Cells by Active Contours with Coherence and Boundary Improvement Filter, IEEE SSIAl2010, Austin, Texas, May 24, 2010.
- Title:** An Active Vector Field for Boundary Extraction of Objects with Complex Geometric, SPPRA 2010, Austria, Innsbruck, Friday, February 19, 2010.
- Title:** An Integral Active Contour Model for Convex Hull and Boundary Extraction, International symposium on Visual Computing, Las Vegas, **Nov. 30-Dec. 02, 2009.**
- Title:** Shape's Related 3D Objects Indexing and Image Database Organization, IEEE Southwest Symposium on Image Analysis and Interpretation, Santa Fe, New Mexico, **March 25, 2008.**
- Title:** Monotonic Vector Forces and Green's Theorem For Automatic Area Calculation, IEEE International Conference on Image Processing, San Antonio, **Sep. 16-18,2007.**
- Title:** Content Based Search in Web Archives, World Congress in Applied Computing – Internet Computing 2007, Las Vegas, June 25-28, 2007.
- Title:** Automatic Concavity's Area Calculation Using Active Contours and Increasing Flow. IEEE International Conference on Image Processing, Atlanta Georgia, Oct. 08-11,2006.

Title: Multiple Surfaces Reconstruction from 2D Sections Using an Increasing 2D Vector Flow, The 2006 World Congress in CS Comp. Eng., and Applied Comp., Las Vegas, June 26-29,2006

Title: A New Automatic Concavity Extraction Model, IEEE Southwest Symposium on Image Processing and Analysis, Denver, Colorado, March 26-28,2006.

Title: Heat Equation to 3D Image Segmentation, The 9th World Multi-Conference on SYSTEMICS, CYBERNETICS AND INFORMATICS, WMSCI 2005, Orlando, USA , July 10-13, 2005.

Title: A New Active Convex Hull Model for Image Database's Search Space Partitioning, 2005 World Congress in Applied Computing - VISION'05, Las Vegas, June 20-23, 2005.

***Given Seminar Talks, 2004- present***

**Title:** Poisson Equation Generated Vector Fields on Images for the Purpose of Segmentation, Ontology Group seminar, **Sept. 17, 2015.**

**Title:** Handling Noise And Multiple Region Segmentation With A Euler – Lagrange Poisson Active Contour, Colloquium, Department of Mathematics, Monday **February 16, 2015**, Given by Adam under my supervision and participation in the talk.

**Title:** New Automated Melanoma Detection Rules, **Invited Lecture** at Baylor University Medical Center –Cancer Center–Skin Tumor Seminar (Skin Tumor Board): November 19, 2014, 7AM.

**Title:** Partial Differential Equations and Active Contour Models. Seminar at Department of Mathematics, TAMUC, November 04, 2013,

**Title:** What You Can Do With a Mathematics Degree? – Math Club Meeting, Jan. 27, 2012

**Title:** About Visit Experience and Ideas on Identification, Matching and Tracking, Mathematical Colloquia Dept. of Mathematics, Nov. 30, 2011, 3:30PM-4:30PM.

**Title:** Mathematical Concepts with Image Analysis Applications, November 18, 2011, 1PM -2PM, **Invited Seminar**, University of Louisiana at Lafayette, Dept. of Mathematics.

**Title:** About Visit Experience and Ideas on Identification, Matching and Tracking, Mathematical Colloquia Dept. of Mathematics, Nov. 30, 2011, 3:30PM-4:30PM.

**Title:** New Family of Active Contours with Image Enhancement & Region Matching, Math Department Colloquium, TAMUC, Nov. 23, 2010, 3:30PM-4:30PM.

**Invited Seminar at UT Arlington**, Applied Mathematics Seminar-Department of Mathematics at UT Arlington, **March 06, 2009**, 2:30, Pickard Hall, Room304, Title: The Exact Solution of the Active Convex Hull Model And Its Application to Image Segmentation, attended by both Math and CS Faculty, Ph.D. and Master Students,

**Title:** The Active Convex Hull Model Its Level Set Presentation and Exact Solution. Math Colloquium on **November 13, 2008**, 3PM-4PM;

**Invited Seminar:** Regular Seminar Dept of Physics TAMUC- **September 27,2007**, 4PM-5PM, Room 127, Science Build., Title: Image Databases to Science. Methods for Features Extraction.

**Invited Seminar at UT Arlington**, Applied Math Seminar, Dept of Mathematics, **Feb. 02,2007**-2:30, Room 304, Title: About An Edge Where Mathematics and Computer Science Meet;

**REU seminar on June 06, 2007**, Title: Enhancement and Features Extraction from Surface Images.

Title: Image Database Management and Indexing, Brain, Computation and Mind Seminar, Dept. of CS, December 08,2006, Science Building 355.

Title: Level Set Formulation of the Heat Differential Equation, Applications to Content Based Image Retrieval, Dept of Mathematics and CS, Jour 129, May 05,2006, 12-1:30PM.

Title: Introduction to Mathematica, and its Applications; An Application of Derivatives and Interpolation to 2D and 3D objects modeling, Image Evaluation and Retrieval; *TAMUC, Undergraduate Research Program, June 07-08,2005*,

Title: Digital Image Databases and 3D Visualization Applications to Science and Industry, *TAMU-Commerce, Department of Chemistry, February 10,2005.*

Title: A New Image-Region's Active Convex Hull Model For Content Based Image Retrieval, *TAMU-Commerce, Dept Math and Dept of CSIS, Sept. 30.2004.*

Title: Over Some Open 2D/3D Shape Features Extraction and Matching Problems, *TAMU-Commerce, Dept CSIS, Sept. 29.2004.*

Title: An Introduction to Digital Image Databases and Content-Based Image Retrieval, *TAMU-Commerce, Depts. of Math, CSIS, Sept. 16.2004.*

#### **NAU, 2001-2004**

Title: Heat Equation and Gradient Flow to Capture an Image Object in a Dynamic Image Database. *NAU- Department of Math and Statistics, Regular Seminar, USA, 04/02/2003.*

Title: Images interpolation and Image database querying. Active Contours. *Northern Arizona University- Department of Math and Statistics, Regular Seminar, USA, 11/26/2002.*

Title: *Shape matching of words in Digitized Renaissance Books. Smooth Reconstruction and Visualization of Multiple 3D Objects in Case of Shortage Input Data. Computer Science Dept.- Eastern Michigan University, USA, 04/01/2002.*

Title: Surfaces Construction Using Regularities and Sequences of Observation, *Northern Arizona University- Department of Math and Statistics, Regular Seminar, USA, 03/19/2002.*

Title: Over optimal surface reconstruction methods, *Applied Math Seminar, Department of Mathematics and Statistics- Northern Arizona University, USA, 01/23/2002.*

Title: Math and Statistics to Image Processing and Objects Reconstruction. An Example Approach, *NAU- Department of Math and Statistics, Regular Seminar, USA, 10/23/2001.*

#### *In Europe:*

Title: 3D reconstruction and visualization of human tibia for prosthesis design, *IM-BAS, Bulgaria, 2001.*

Title: A software system, developed by Visual ++C, for shape matching of words in digitized Renaissance books. *Meeting of the International project DEBORA, IST-Lisbon, Portugal, fall 2000.*

Title: 3D surface modeling, reconstruction and visualization of multiple complex subsurface objects - ore bodies, ore types, groundwater units. *CVRM-IST-Lisbon, Portugal, 1998-2000.*

Title: Shape matching of Renaissance Words using regularities and finite numerical sequences. *General meeting of the International project DEBORA, Attended by the members of RFV-INSA, Lyon, France, Comp. Sc. Dep. - University of Lancaster-UK, CVRM-IST, December 1999.*

Title: Virtual Multimedia Library – architecture, contents, *INSA-Lyon, Laboratoire de Reconnaissance de Formes et Vision (RFV), France, June 1999.*

Title: Over some problems of Image to Text/Text to Image transfer system, the Group of Prof. Dr. Liming Chen- *Ecole Central de Lyon, software developing Company –SGBI- Lyon, France, June 1999.*

Title: Solving of 3D modeling, visualization and recognition problems using series of plane sections, *Technical University of Dresden – Institute of Acoustics, Germany, September 1997.*

Title: Regularities and finite numerical sequences to 3D objects representation, shape reconstruction and visualization, *CIMPA Institute “Virtual Reality”- Nice, France – June 1995.*

Title: Objects recognition by single view, *CVRM-IST- Lisbon, Portugal, June 1994.*

Title: New effective method and software tool to 2D/3D objects comparing, *CVRM-IST, Portugal, 1994.*

Title: 3D Objects Recognition Method to Robot Orientation and Control in Nuclear Reactors, *CVRM-IST, Lisbon, Portugal, October 1993.*

Title: Recognition of shape from finite series of plane figures. *NATO Advanced Study Institute “Shape in Pictures”, Driebergen, the Netherlands, 1992.*

Title: Application of regular structures and identification sets to 3D objects recognition in robotics, *International Lab of Artificial Intelligence- Slovak Academy of Sciences- Bratislava, October 1990.*

Title: Application of FORTH language to robot’s local motion control;

Title: An aspect graph based effective approach for 3D objects and scenes description to robot orientation in a global scene. *Polish Academy of Sciences-Institute of Biocybernetics and Bioengineering, 1987-1989.*

#### **RESEARCH ACHIEVEMENTS in:**

- ☐ Skin Cancer Prediction – **Fall 2015 present;**
- ☐ Automated objects partitioning with active contour – **2014 present;**
- ☐ Automatic melanoma diagnosis and skin lesion features extraction- **2010 – present;**

- ☒ Firearms Threat Assessment- **Fall 2009-present;**
- ☒ Tracking objects in video sequences- **2009-present;**
- ☒ Active Contours –Heat, Euler-Lagrange, Poisson PDEs– **2004 present;**
- ☒ Content Based Image Retrieval –in 2D and 3D;
- ☒ Features extraction, and indexing in 2D and 3D, **2004 present;**
- ☒ Scientific Visualization and reconstruction - 2D/3D objects modeling and interpolation;
- ☒ Digital and Multimedia Libraries;
- ☒ Image processing; Computer Vision; Pattern recognition;
- ☒ Robot control and vision.

*Fields of application:* Medicine, Security and Surveillance, Robotics, Internet.

### **FELLOWSHIPS AND GRANTS:**

- ◆ Competitive Travel Grant by Faculty Development Committee, TAMUC, 2005-2016.
- ◆ The undergraduate research I did was granted and funded for presentation by the Org Committee of the Young Mathematicians Conference, Ohio State University, August 19-22.2004.
- ◆ Invited Professor at CVRM-IST, under *European Community Project DEBORA*, fall of 2000;
- ◆ NATO Senior Research Fellow at IAL of CVRM-IST, *Lisbon, Portugal*, Title: Morphological and recognition techniques to geometrical modeling and visualization of multiple complex 3D objects, 1999;
- ◆ NATO Senior Research Fellow, at IAL-CVRM- IST, *Lisbon, Portugal*, Title: Image Analysis and Visualization to Quality, Environment and Natural Resources Control, 1998;
- ◆ Participant of NATO Advanced Study Institute “Deposit and Geoenvironmental Models for Resources Exploitation and Environmental Security“, *Hungary-Matrahaza*, 1998.
- ◆ Visiting Assistant, Technical University of Dresden – Institute of Acoustics- fall 1997, DFG program;
- ◆ Visiting Lecturer, CIMPA Summer Institute “Virtual Reality”, *Nice - France* – 1995;
- ◆ Research Fellow under European Community - PECO, CVRM- IST, *Lisbon, Portugal*, Title: Application of Pattern Recognition to Material Reconstruction and Defectology, 1993- 1994;
- ◆ Invited lecturer of NATO Advanced Study Institute “Shape in Pictures”, *The Netherlands*, 1993.
- ◆ Research Fellow at the International Laboratory of Artificial Intelligence- Slovak Academy of Sciences- Bratislava, *Slovakia*, end of 1990-1991;
- ◆ The paper “Automatic Reconstruction of 3D Branching Objects” was granted as the best one developed at IM-BAS, 1996.

### **REVIEWIEVING PAPERS: IN THE US, 2002- Present.**

#### **Journals:**

- ☞ Journal of Computer and System Sciences- Elsevier - **Impact Factor 1.583, 2017-present**
- ☞ PLOS One- **Impact Factor 4.11- 2017- present**
- ☞ Expert Systems with Applications – Elsevier, **Impact Factor 2.981 by SCI, 2016- present**
- ☞ J. Investigative Psychology – Threat assessment – **IF 0.6** , 2017
- ☞ Neural Computing and Applications - **IF 1.569, since 2015- present;**
- ☞ Discrete Applied Mathematics – **IF 0.802, since 2014- present;**
- ☞ - IEEE Transactions on Medical Imaging – **IF: 3.79, 2014- present**
- ☞ Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization- Taylor & Francis, **IF-1. 39, 2014 - present;**
- ☞ The Journal of Applied Mathematics and Computation, Elsevier Pub., **Impact Factor 1.138, since 2010, 3 papers.**
- ☞ The Journal of Applied Mathematics and Computation, Elsevier Pub., **Impact Factor (IF) 1.138, since 2010 present,**

- ~ Pattern Analysis & Applications Journal, Published by Springer Verlag, **IF 1.346, since 2010** .
- ~ Annals in Mathematics and Artificial Intelligence, Springer Verlag- **IF-0.35, 2013 present;**
- ~ The Journal of Applied Mathematics and Computation, Elsevier Pub., **IF 1.138, since 2010,**
- ~ International Journal of Computer Mathematics -**2012.**
- ~ The Arabian Journal for Science and Engineering, Published in Saudi Arabia, **2009, 2012**
- ~ Pattern Analysis & Applications Journal, Published by Springer Verlag, **since 2007, present, IF 1.367,** Journal Citation Reports®, Thomson Reuters,
- ~ IEEE Transactions on Information Technology in Biomedicine, **since 2007.**
- ~ IEEE Transactions on Image Processing, one of the top journals in the field of Image Processing- **Impact Factor 2.8, 2004-2007;**
- ~ IEEE Trans on Signal Processing, one of the top journals in the field of Signal Processing, **Impact Factor 2.35, 2005;**
- ~ The International Journal of Computers & Geosciences, published by Elsevier, devoted to all aspects of computing in geosciences, and an official representative of Mathematical Geology, **Impact Factor- 2004: 0.903, 2001-2006.**

#### Conferences:

- ~ **18<sup>th</sup> IWCIA2017 - by Springer Verlag LNCS** – 5 papers, March, April 2017
- ~ **2016 IEEE SSI AI 2016,** 6-8, March 2016, Santa Fe, New Mexico.
- ~ **IWCIA2015** – 17 Workshop Indian Statistical Institute, Kolkata, December 2015, India.
- ~ **The 9<sup>th</sup> Inter Conference on Differential Equations and Dynamical Systems-2015,**  
Member of the Local Host Committee, Member of the Global Scientific Committee  
Organizing special session: Applications of DE and Dynamical Systems to Science and Industry
- ~ **ISSPIT 2014, IEEE International Symposium on Signal Processing and Information Technology,**  
Dec. 15-17, 2014 Jaypee Institute of Information Technology, Noida, India
- ~ The 21<sup>th</sup> International Conference on Computer Graphics, Visualization and Computer Vision'2014 – in co-operation with EUROGRAPHICS, **WSCG2014**
- ~ IWCIA2014 – 16 Workshop on Combinatorial Image Analysis- to be held in Check Republic-  
*Publication by Lecture Notes in Computer Science* – Springer Verlag, **4 paper December 2013.**
- ~ IEEE International Symposium on Signal Processing and Information Technology, **ISSPIT 2013,**  
Athens Greece, December 2013, Review 4 papers, **October 2013;**
- ~ The 21<sup>th</sup> International Conference on Computer Graphics, Visualization and Computer Vision'2013  
in co-operation with EUROGRAPHICS, **WSCG2013,** June 2013, Czech Republic, **3 Papers-  
April 2013.**
- ~ 8th International Conference on Pervasive Computing Technologies for Healthcare, **20-23 May  
2014, Oldenburg, Germany**
- ~ 15th IWCIA2012 – 15 Workshop on Combinatorial Image Analysis- **Lecture Notes in Computer  
Science** – Springer Verlag, **2 papers 2012, 4 papers** – 2013,
- ~ IEEE International Conf. on Image Processing, ranked #39 out of 3,500 Computer Science  
Conferences, ICIP 2010, 5 papers -2010, 4 papers 2011, 6 papers 2012,
- ~ The 19th International Conference on Computer Graphics, Visualization and Computer  
Vision'2011 – WSCG, 11 papers – 2010-2014;
- ~ the IASTED International Conference on Signal Processing, Pattern Recognition and Applications  
(SPPRA 2011), 2010 – 6 papers; 2011 – 2 papers, 2012 – 4 papers,
- ~ IEEE – ISSPIT symposium, IEEE International Symposium on Signal Processing and Information  
Technology, 2011 – 4 papers; 2012 – 6 papers, 2013 – 4 papers.
- ~ 4th International Conference "Application of Mathematics in Technical and Natural Sciences"
- ~ AMiTANs, 1 paper 2012;

- ☞ **IEEE – ISSPIT** symposium, IEEE International Symposium on Signal Processing and Information Technology, **since 2007-present.**
- ☞ “Appl. of Mathematics in Technical and Natural Sciences”, Bulgaria, Euro-American Consortium for Promoting the Application of Math, August **2009, 2012;**
- ☞ **IEEE** International Conference on Acoustics Speech and Signal Processing, April 2009, Taipei Taiwan, **ICASSP, October-November 2009, #3 out of 3,511 CS conferences, Microsoft Research, on the base of citations;**
- ☞ Signal Processing, Pattern Recognition and Applications (**SPPRA**)-**ISTED, 2008-present.**
- ☞ The IEEE International Conference on Image Processing, **ICIP**, world wide top conferences in the field, rate of acceptance between 33% and 43%, since **2006, present, #39 out of 3,511 CS conferences, Microsoft Research, on the base of citations;**
- ☞ The 10-th – 19<sup>th</sup> International Conference on Computer Graphics, Visualization and Computer Vision, **WSCG2**. Czech Republic, since **2004-present, #441 out of 3,511 CS conferences.**

*In Europe:*

- ☞ The 5th Ibero - American Symposium on Pattern Recognition - SIARP2000, *Portugal*, September 2000.
- ☞ The Portuguese Conference on Pattern Recognition-RecPad2000, *Portugal*, May 2000.
- ☞ The VII Congress of Theoretical and Applied Mechanics, Sofia, *Bulgaria*, September 1993;
- ☞ The Journal Computers and Artificial Intelligence, Published by *Slovak Academy of Sciences*. 1991.

Review of a Computer Science Master Thesis for the Conference of Southern Graduate School Master Thesis Award 2006, November 2006.

**REVIEWER OF RESEARCH PROJECTS PROPOSALS** (dealing with image processing, 3D objects modeling and visualization) for *Natural Environmental Research Council*, Polaris House, North Star Avenue, Swindon SN2 1EU, *United Kingdom*. 2001.

**EDITORIAL BOARD** of the Journal of WSCG [ISSN 1213-6972], invited **October 2007**.

**SCIENTIFIC/PROGRAM COMMITTEES: IN THE US: 2001-PRESENT:**

Member of the Program Organizing Committee of:

- ✓ Program Committee-IWCIA2017 – 18th Workshop on Combinatorial Image Processing, Plovdiv, Bulgaria, June 2017, Accepted papers will be published by LNCS- Springer Verlag.
- ✓ Organizing Committee Texas Section MAA 97 meeting, hosted by Department of Mathematics, Texas A&M University Commerce, March 30 –April 1st, 2017.
- ✓ Program Committee IEEE SSI AI 2016, 6-8, March 2016, Santa Fe, New Mexico..
- ✓ **The 9th Inter Conference on Differential Equations and Dynamical Systems,**
  - a) Member of the Local Host Committee; b) Member of the Global Scientific Committee
  - b) Organizing and Chairing the special session: Applications of Differential Equations and Dynamical Systems to Science and Industry
- IWCIA2015 – 17 Workshop **Indian Statistical Institute, Kolkata, December 2015, India.**
- IWCIA2014 – 16 Workshop on Combinatorial Image Analysis- Member of the Program Committee- Publication by Lecture Notes in Computer Science – Springer Verlag, **May 2014, Brno, Check Republic.**
- IWCIA2012 – 15 Workshop on Combinatorial Image Analysis- Member of the Program Committee- Publication by Lecture Notes in Computer Science – Springer Verlag, **Nov. 2012, UT at Austin, TX.**
- Chairman Documentation Committee – SPDS2011, **Seoul, South Korea, June, 2011.**
- IASTED- Int. Conf. on Signal Processing, Pattern Rec, and Appl. (SPPRA), since **2008 present;**
- IEEE Int. Symposium on Signal Processing and Information Technology, since **2008 present;**
- Technical Program Committee – IEEE International Conference on Image Processing (ICIP), top one in the field, **since 2006 present.**
- Program Committee of Image Processing and Computer Vision 2006- The 2006 World Congress in Computer Science Computer Eng, and Applied Computing, June 25-28, 2006, Las Vegas;

[http://www.world-academy-ofscience.org/worldcomp06/ws/PCV/ipcv\\_committee](http://www.world-academy-ofscience.org/worldcomp06/ws/PCV/ipcv_committee)

- Program Committee of The 10th World Multiconference on Systemic, Cybernetics and Informatics July, 2006 - Orlando, Florida, <http://www.iiisci.org/wmsci2006/website/ProgramCommittee.asp>
- Technical Program Committee – IEEE International Conference on Image Processing, top one in the field, since **2006-present**;
- The 2005 International Conference on Modeling, Simulation and Visualization Methods-MSV'05, World Congress of Applied Computing: June 27-30, 2005, USA;
- The 2005 International Conference on Computer Vision - VISION'05: World Congress of Applied Computing: June 27-30, 2005, USA;
- the International Conference on Computer Graphics, Visualization and Computer Vision, WSCG, in co-operation with EUROGRAPHICS, since **2002-present**;

*In Europe:*

- Member of the Scientific Committee of 5th Ibero-American Symposium on Pattern Recognition - SIARP2000, Lisbon, *Portugal*, September 11-13, 2000;
- Member of the Program Committee of the 7<sup>th</sup> Congress of Theoretical and Applied Mechanics (CTAM), Sofia, *Bulgaria*, September 1993;
- Member of the Organizing Committee of the 6<sup>th</sup> CTAM, Druzba-Varna, *Bulgaria*, September 1989.

#### **Chair of sessions - International Conferences:**

- The 9th Inter Conference on Differential Equations and Dynamical Systems, Dallas Texas 2015, Special session: Appl. of Differential Equations and Dynamical Systems to Science and Industry
- IASTED- International Conference on Signal Processing, Pattern Recognition, and Applications (SPPRA), Austria, Innsbruck 2010;

*Session:* APPLICATIONS IN MEDICAL IMAGING, the 2006 World Congress in Computer Science Computer Engineering, and Applied Comp, June 25-28, 2006, Las Vegas;

*Session:* LOW- & HIGH-LEVEL SEGMENTATION + CLASSIFICATION + DETECTION, 2005 World Congress in Applied Computing - VISION'05, Las Vegas, June 20-23, 2005;

*Session:* Image and Multidimensional Signal Processing, The 9th World Multi-Conference on SYSTEMICS, CYBERNETICS AND INFORMATICS), WMSCI 2005, Orlando, July 10-13, 2005.

- Chairman of the session “Modeling and Identification”, International Conference Modeling Identification and Control, Innsbruck, *Austria*, February, 1992.

#### **PUBLICATIONS:**

Total number of papers: 130;  
Number of peer reviewed papers: 93;  
Books: 2.

#### **CITATIONS:**

**Google Scholar – 396 citations, i10 index – 14, h index 12, 66 papers;**

**Microsoft Academic/ Microsoft Research: G-Index-7; 26 papers, 65 citations,** by 100 authors, <http://academic.research.microsoft.com/Author/368409/nikolay-metodiev-sirakov>

**IEEE Xplore – 15 of my paper are posted by this Digital Library;**

**DBLP Bibliography Server – 23 of my papers are listed,** Germany, Impact 1.21 out of max 3.31; in the top 15% sources (Journals, Conferences, Databases) with impact of publication venues in Computer Science - May 2003 (CiteSeer - <http://citeseer.ist.psu.edu/impact.html> );

**The server is #190 out of 1221-** Journals, Conferences, Servers & Databases with impact to CS;

**Keith Price Bibliography, Annotated Computer Vision Bibliography, Microsoft Research:** 15 of my papers are posted by this bibliography.

FOUNDER OF VIRTUAL RESEARCH GROUP:



I have founded this group in 2002 to deal with practical problems solution. Under my leadership and working through Internet this group developed an approach and tool to volume calculation of subsurface objects and minerals. Using the obtained results we published two papers.

1. Dan Hack-Halstead Geo Inc, Portland - Oregon, USA, [HalsteadGeo@aol.com](mailto:HalsteadGeo@aol.com);
2. Dr. Marcin Iwanowski - Warsaw Univ. of Technology, Poland, [iwanowski@isep.pw.edu.pl](mailto:iwanowski@isep.pw.edu.pl);
3. Rumen Mironov, Technical University Sofia, IPRL, Bulgaria, [rpm@vmi.bgciict.acad.bg](mailto:rpm@vmi.bgciict.acad.bg).

#### **MEMBERSHIP IN PROFESSIONAL SOCIETIES:**

##### *IN THE US:*

- IEEE member, 2003-present.
- Mathematical Association of America-2006-present.
- Virtual Society for Multinational Studies of Aggregate Resources – Coordinator Prof. William Langer – U.S. Geological Survey, Denver Colorado, USA, since 1998;

##### *International:*

- Spatial Data Laboratory Network – Coordinator Prof. Chung Chang-Jo- Spatial Data Analysis Laboratory, Geological Survey of Canada, Ottawa, Canada, since 1998;
- Scientific Council of Bulgarian Association of Pattern Recognition-member of IAPR, since 1994;
- Bulgarian Association of Robotics, since 1987;
- Union of Bulgarian Mathematicians, since 1985.

#### **RECORD OF RESEARCH PROJECTS:**

##### *IN THE US, 2002-Present:*

- ✍ Tracking multiple objects in a video- Dr. Arie Nakhmani, Ph.D. student Prain Kandhare, **2017 present**
- ✍ Explosive containers automatic extraction from cluttered baggage and reconstruction – in collaboration with Dr. Arslan, Chetana Divacar- Grad. Student, **2016**;
- ✍ Skin lesion classification to benign, dysplastic nevi and melanoma, - in collaboration with Dr. Menter MD, Dr. John Griffin MD, Dr. Mete TAMUC - **2015- present**.
- ✍ Automatic skin lesion features extraction from images, skin lesion cancer identification – collaboration with Dr. Mete, Dr. Ou- TAMUC, Dr. Marie Luong-Univ. Paris 13, R. Selvaggi MD, since **2010-present**.
- ✍ New Active Contour on the Euler-Lagrange Partial Differential Equation, **Dr. M Todorov**, Technical University, Sofia, Bulgaria, **2013-2014**, using Euler-Lagrange and Poisson PDE – Mr. A. Bowden- Dept. of Mathematics, TAMUC-**2014-present**.
- ✍ Automatic Tracking Objects in Video, Dr. Arslan, Pravin, Kanthadare, TAMUC, **2013 present**.
- ✍ Convex Active Contours, skin lesion features extraction, collaboration with **Dr. M. Luong, University Paris 13, France, Dr. Tung Vietnam, 2011-present**.
- ✍ Fire Arms Threat Assessment - collaboration with Dr. Attardo **2008 present**, Dr. Arslan -**2011-present**, Dr. Hempelmann **2012 present**; Dr. Blount, **2013 present**.
- ✍ Invariant Matching of objects using boundary geometric information, collaboration with Dr. Arslan, since **2009**.
- ✍ Tracking neutrophil in video sequences –**Dr. H. Kojouharov, UT at Arlington, 2009-2010**.
- ✍ Matching objects boundaries – collaboration with Dr. Arslan, **2009 present**;
- ✍ **Dr. Benito Chen-Chanpentier, and Dr. H. Kojouharov**, Dept. of Math UT at Arlington, In the field of Math Modeling of Bacteria Destruction by White Blood Cells, **since 2010**.
- ✍ Facial features extraction and emotions recognition, joint research with Dr. Mariofana Milanova, CS Dep. **University of Arkansas-Little Rock, Fall 2008**.
- ✍ New active convex hull model on the exact solution of the geometric heat diff. eq., **2008**.
- ✍ Image Database indexing in 2D and 3D, TAMUC, 2007-present;

- ✍ Automatic concavities extraction of image regions, joint research with Dr. Italo Simonelli, Dept of Math-TAMUC, Fall 2005-Spring 2006;
- ✍ Intelligent Image Database Mining Systems, Dr. Sang Suh, Dept of CS-TAMUC, 2005;
- ✍ Active regions – an approach to combine level sets with statistics, joint survey and research with Dr. Italo Simonelli, Dept of Math-TAMUC, Fall 2004-Spring 2005.
- ✍ An application of Image Processing to segmentation of Chemical Images, a joint survey with Dr. Ben Jang, Dept. of Chemistry, Spring 2005.
- ✍ Image object's motion interpolation, joint survey and study with Dr. Hasan Coskun, Dept of Math-TAMUC, Fall 2004.
- ✍ A new convex hull model for image regions. An application to image database mining for image features extraction, indexing and management. TAMU Commerce, Dept of Math, Dept of CSIS, with the help of Dr. Richard Kreminski, Fall 2004.
- ✍ Biomedical Image Feature Extraction for Content Based Retrieval, PI Dr. Phillip Mlsna Elec. Eng. Dept. -NAU, USA. Funded by Department of Energy 2003-2004.
- ✍ Variational methods to 3D objects detection and visualization, Joint research with Assoc. Prof. John Nueberger, Math & Stat Dept., NAU, USA, 2004
- ✍ Shape support, regularities and B-splines to image database querying. Joint research with Prof. James Swift, at Math & Stat Dept., Dr. Phillip Mlsna Elec. Eng. Dept. -NAU, USA.
- ✍ Application of Heat Diff. Eq. to a new convex hull model for regions location in a dynamic image database. Joint research with Assoc. Prof. John Nueberger, Math & Stat Dept., NAU.
- ✍ A new approach to increase accuracy of 2D sections interpolation. Joint research with Dr. M. Iwanowski, Warsaw University of Technology, Poland, R. Mironov, Technical Uni. Sofia.

*In Europe:*

- ✍ 2D sections interpolation, at Image Analysis Lab at CVRM, IST- Lisbon, *Portugal*, 2000-2001.
- ✍ Image enhancement and edge detection, IST-CVRM- Portugal, RFV- INSA, Lyon, *France*, 1999-2000.
- ✍ Geodesic sets definition in case of empty intersection, at CVRM, IST- Lisbon, *Portugal*. 2000.
- ✍ Image segmentation, at IAL - CVRM, IST- Lisbon, *Portugal*, 1998-1999.

*Visualization and reconstruction Projects: IN THE US, 2001-Present:*

- ✍ A new effective approach to volume calculation of 3D reconstructed subsurface objects. Under development together with HalsteadGeo Inc, Dr. Michel Fever Portland - Oregon, USA, Dr. Marcin Iwanowski - Warsaw University of Technology, Poland, 2002-Present.
- ✍ 3D Reconstruction and visualization of gravel deposit. Segmentation and 3D visualization of inclusions, together with HalsteadGeo Inc and Dr. Fever Portland, Oregon, US, 2001-2002.

*3D Reconstruction and Visualisation*

- ✍ 2D/3D objects reconstruction and visualization using sparse data, at Image Analysis Lab (IAL) - C.V.R.M. -Instituto Superior Tecnico (IST), Lisbon, *Portugal*, 1999-2001;
- ✍ Multiple surfaces reconstruction and visualization, based on order and sequences of observation, at Institute of Mechanics (IM)-Bulgarian Academy of Sciences (BAS), *Bulgaria*, 2000;
- ✍ 3D reconstruction and visualization of multiple subsurface objects. Application to ore deposit and groundwater units reconstruction, at IAL-CVRM-IST, *Portugal*, 1998-1999;
- ✍ 3D modeling and visualization of flaws and cracks in plastic and non-plastic materials, together with IM-BAS, 1996, 2001.
- ✍ 3D visualization using gray level image. Shape from shading, together with Technical University (TU)–Sofia, Dept. of Telecommunications, Image Processing and Recognition Lab (IPR), *Bulgaria*, 1998.
- ✍ Modeling, reconstruction and visualization of multiple, complex 3D objects. Branching problem. Overlapped objects. Surface visibility, *at IM-BAS*, 1994-1997;
- ✍ Pattern Recognition and Visualization to Material Reconstruction and Defectology, IAG-CVRM-IST, *Lisbon, Portugal*, 1993-1994.

*Artificial Intelligence: Computer Vision and Decision Support Systems Projects:*

- ☐ Matching 3D reconstructed objects, together with CVRM-IST– Lisbon *Portugal*, 2001;
- ☐ Shape matching of words in digitized Renaissance Books, together with IST-CVRM-Portugal, RFV-INSA, Lyon, *France*, 1999-2000;
- ☐ 2D objects recognition to multiple complex 3D objects reconstruction and visualization and Image processing, together with IAL-CVRM-IST, 1995-1999.
- ☐ 3D defects detection in mechanism components, IM-BAS, Bulgaria, CVRM-IST, *Portugal*, 1997;
- ☐ Definition of the new notion Morphological Similarity and its application to 2D objects recognition and partitioning, at IM-BAS, *Bulgaria*, 1996.
- ☐ 2D/3D objects modeling and recognition by single and multiple viewpoints, at Center of Mathematics Comp. Science & Mechanics-BAS, 1991-1993;
- ☐ 3D modeling and recognition. New economic numerical algorithm to curvature calculation, at Slovak Academy of Sciences – Int. Lab of Artificial Intelligence, Bratislava, *Slovak Republic*, 1990-1991;
- ☐ 3D objects recognition by sets and order of identification, at IM-BAS, 1988-1990.
- ☐ Classification of objects in limestone cave, Artificial Intelligence Lab, Institute of Math – BAS, 1990.
- ☐ Environmental Decision Support System for Analysis, Evaluation and Management of Groundwater Resources Based on Integrated GIS Technology, together with CVRM-IST, *Portugal*, 1997.
- ☐ Decision Support System to 3D defects detection, together with CVRM-IST, *Portugal*, 1995.

#### *Digital Libraries Projects:*

- ☐ Automatic Feature Extraction and Recognition for Digital Access of Books of the Renaissance, at CVRM-IST, Lisbon, *Portugal, France*, 2000.
- ☐ Pages enhancements and segmentation to text and pictures, at CVRM-IST, Lisbon, *Portugal*, 2000.
- ☐ Multimedia Libraries, at Pattern Recognition and Image Proc. Lab –INSA, Lyon, *France*, 1999.
- ☐ Virtual Libraries – architectures, delivery and storage of contents, together with TU–Sofia, Dep. of Telecommunications, Image Processing and Recognition Group, 1998, 2000;
- ☐ Architecture, storage and transfer of contents, together with IPR-DT-TU, *Bulgaria*, 1999.

#### *Robots Vision and Control Projects:*

- ✘ 3D objects modeling and recognition in Nuclear Reactors, together with Russian Academy of Sciences, *Czech Academy of Sciences* (CAS), BAS, Bulgarian Nuclear Power Station “Kozlodui”, 1987-1990.
- ✘ An optimal approach and software tool to robot’s local motions control, together with *Russian Academy of Sciences*. CAS, BAS, Bulgarian Nuclear Power Station “Kozlodui”, 1987-1990;
- ✘ 3D objects recognition to robot orientation in a global scene, together with Polish Academy of Sciences-Institute of Biocybernetics and Bioengineering, Warsaw, *Poland*, 1987-1989.

3D MODELLING, VISUALIZATION SOFTWARE TOOLS: 3D SORS, MatLab, Mathematica, SurfDrive.

SOFTWARE LANGUAGES: Assembler, C++, Fortran, FORT.

#### *SUPERVISING SOFTWARE DESIGN AND DEVELOPMENT PROJECTS:*

##### *IN THE US, 2002-Present:*

- ☐ Tracking objects with SIFT, SURF, GM-PHD method – **2016 present**
- ☐ Active Contour using Euler-Lagrange and Poisson PDE – MatLab-**2014 present**
- ☐ Tracking a single object with partial occlusions in a video - **2013**
- ☐ Tracking object with S-ACES and Modified Kalman Filter-**2012**
- ☐ Active Contour for noise surpassing, - **2011,**
- ☐ Rotational invariant objects matching – **2011.**
- ☐ Expanding active contours for tracking – **2010.**
- ☐ Rotational and scaling invariant regions matching – **2010.**
- ☐ Integral Active Contour Model, **2008- present, Java.**
- ☐ Active Convex Hull Model, on the approximation and exact solutions, **Fall 2008, Java.**
- ☐ Image Database indexing, Spring, Summer 2008, **VC++, C sharp;**

- ☞ Video compression, Iris Recognition, **Matlab, Fall 2008;**
- ☞ Stegonagraphy – C++, **2007;**
- ☞ Corners detection for tracking objects- C++, **2007;**
- ☞ A New Active Convex Hull model, C++, Sharp C, 2004-2005, **Completed in Java Fall 2008;**
- ☞ Image Segmentation guided by the Heat DE with elasticity features, C++, REU, 2004.
- ☞ 3D Edge Detection and Visualization by Heat DE, *Mathematica* tool, REU, 2004.
- ☞ Heat DE with shells to image segmentation, NAU-Math and Stat Dept., 2003.
- ☞ Shape to support transformation, C++, run under Windows/NT, NAU, 2003.
- ☞ Image Database querying, shape features extraction and matching, C++, run under Windows/NT, NAU-Math and Stat Dept., 2002-2003.

*In Europe:*

- ☞ Matching words in digitized Renaissance Books from 16 century. Run under Windows 95/98/NT, C++, Under European Community funded project DEBORA, 1999-2000;
- ☞ Matching 3D reconstructed subsurface objects. C++, 2000;
- ☞ Multiple 2D/3D objects reconstruction and visualization. Windows 95/98/NT, C++, 1998.
- ☞ Filtering of 2D images. Run under DOS. Quick C. 1997;
- ☞ Multiple 2D objects recognition and visualization. Run under DOS, Quick C, 1993-1994.

**DEVELOPED SOFTWARE TOOLS:**

- ☞ Capable of 3D objects recognition using stereo data. Motorola 6800, FORTH language, 86-89;
- ☞ Capable of robot's local motions control. Motorola 6800, Assembler language, 1987;
- ☞ Capable of generating (15,11) systematical, non-vasiliev's, non-linear, perfect codes correcting one error, Fortran, 1984.

**PARTICIPATION IN FUNDED PROJECTS and GRANTS: IN THE US 2001-present:**

- Title: Delineation of Skin Cancer and Lesions by Filters Supported Active Contour, Research Enhancement Program, PI N.M. Sirakov, **\$14,533, 2010-2011.**
- Title: 3D Segmentation and Features Extraction for 3D Database Indexing, School of Graduate studies, Research Enhancement Grant, **\$ 5698, 2007-2008.**
- Title: 2D Image Segmentation and Efficient Features Extraction for Indexing. A Step Toward the 3D Case, School of Graduate studies, Research Enhancement Grant, \$5000, **2006-2007.**
- Title: Segmentation, Matching and Features Extraction for Content Based Image Retrieval, School of Graduate studies, Research Enhancement Grant, \$4030, 2005-2006.
- Title: Undergraduate Science-Mathematics Research Program Summer 2005 Introduction, granted by Dean of the Graduate School, \$620 ,March 2005.
- Title: The Faculty Development Committee has awarded me with a Competitive Travel Grant in the amount of \$500, Spring 2005.
- Title: Image segmentation for Content Based Image Retrieval. Mini Grant funded by Dean of Graduate Studies and Research, \$520, November 16.2004-August 31.2005, completed.
- Title: Boundary support and its applications - Mr. Christopher Rex (my student in Math 192), funded -\$384 by the Dean of College of Arts and Science, Undergraduate Student Research initiative;
- Title: Biomedical Image Feature Extraction for Content Based Retrieval. PI Dr. P. Mlsna Elec. Eng. Dept. –NAU, **\$43 000** funded by **U.S. Dept. of Energy** grant DE-FC08-01NV13974, 2004.
- Title: An Application of Differential Equations to Image Retrieval and Visualization in 2D/3D, approved for funding by NSF-REU program-around **\$15 000**, 2004.
- Title: An Application of the Heat Differential Equations to Image Processing, funded by NSF-REU program-around **\$6000**. Supervising the research of Catherine Lichten- McGill University, 2003. She was also funded to present our research on the Conference “Summer Undergraduate Research in Math”- august 2003, <http://www.math.ohio-state.edu/conferences/surc/> .
- Title: Objects Detection in an Image Database Using Shape Features, funded by NSF-REU program-around **\$6000**. Supervising the research of Andrey Kislyuk- UC Berkeley, 2003.

## **In Europe:**

- Title: Digital Access to Books of the Renaissance, DEBORA, DGXIII/Telematics Program/LB-5608/A, 4<sup>th</sup> EU Framework, Participants: RFV-INSA, Lyon, France, CS Dept - University of Lancaster-UK, CVRM-IST, Lisbon, Portugal, 1999-2001, funded – 1 000 000 EURO.
- Title: *Automatic Characterization of Ornamental rocks*, COSS - 4<sup>th</sup> EU Framework, University of Bologna-Italy, University of Granada – Spain, Instituto Superior Tecnico - Portugal, 1996-1998, Ranked the 35<sup>th</sup> best project completed during the 4<sup>th</sup> EU Framework;
- Title: *Development of manipulator and tools capable of Nuclear Reactors inspection*. Project № 3.1.7, Czech Academy of Sciences, Russian Academy of Sciences, and Institute of Mechanics-Bulgarian Academy of Sciences. 1987-1990. *Institute of Mechanics funded around \$1 000 000*;
- Title: *Biomechanics of Motions and Robots Control*. Polish Academy of Sciences-Institute of Biocybernetics and Bioengineering, Bulgarian Academy of Sciences –Center of Math. Comp. Sc. & Mechanics. 1986-1989. *Around \$ 130 000 per year*.
- Group and differential-geometrical approaches to modeling and control of coupled-body mechanical systems, PI-Clementina Dimitrova Mladenova, 1997-1998.

## **Recently Submitted Grant Proposals:**

**NIH, R-01, National Cancer Institute – amount requested ~ \$700, 000, Sub. on 02.03.2017**

**Title:** A Novel Automated Dermoscopy-Based Image Analyzer for the Clinical Evaluation of Pigmented Lesions and Early Detection of Melanoma, Baylor University Medical Center, **PI. Dr. A. Menter**, Co-Investigators: Dr. J. Griffin, Dr. J. Frieder, Dr. L. Dickens, Dr. G. Hesler Ph.D., TAMUC- **PI Dr. N.M. Sirakov**, Co-Investigator Dr. M. Mete.

**Department of Homeland Security, ALERT - amount requested for 2 years- \$141,620**

**Title:** X-Ray and CT Baggage Images Segmentation for Potential Explosive Containers Extraction Reconstruction and Recognition, PI. Dr. Sirakov, In Collaboration with Dr. A. Arslan, TAMUC, Surendra Chakrader Nara, Database Software Developer, Infosys Solutions Inc, Sub. July 01, 2016.

**NIH – R03 – Title:** Novel System for Dysplastic Nevi and Melanoma Diagnosing and Prediction, PI-Dr. N. M. Sirakov, Co-Investigator Dr. M. Mete-TAMUC, Co-Investigator Dr. A. Menter, MD, Dermatology Division Baylor U Medical center, Co-Investigator Dr. J.Griffin MD, Dermatology Division Baylor U Medical center, amount requested **\$132,000**,Sub. February 26, 2016.

**DARPA-BAA-14-39 Title:** Automatic Visual Recognition, Tracking, and Semantic Analysis Of Firearms with The help of A Firearm Ontology, PI A. Arslan, Co-PI Dr. S. Attardo, Co-PI C. Hempelmann, Co-PI G.Blount, **Co-PI N. M. Sirakov**, amount requested **\$1,140,000**, submitted **June 2015**, recommended by DARPA to another agency.

**NSF- Proposal for funding The 9th International Conference on Differential Equations and Dynamical Systems, PI Dr. T. Wang, Co-PI Dr. N.M. Sirakov, November 17, 2014. Budget Required: ~\$20,000**

**R03-PA-13-304-October, 16, 2014, Title:** Validation of New Rules for Melanoma Identification, **Budget Required:** 139,000, PI Dr. N. M. Sirakov, **Co-PI: Dr. Menter, Baylor University Medical Center;** Co-PI Mutlu Mete, Consultant Dr. Marie Luong, Rick Selvaggi, MD.

## **Awards and Recognitions:**

1. **Rajesh Shanmuga Sundaram** – my research student received first prize at **lion's innovation showcase** event November 21, **2015**.
2. **Recipient of the TAMU Research, Scholarship, and Creative Activities– “Unfettered Thought” 2015;**
3. **Lockheed Martin Best Pepar Award** on the Automatic Targets Recognition-SPIE Defense Security and Sensing paper:

Arslan, Abdullah N., Christian F. Hempelmann, Carlo Di Ferrante, Salvatore Attardo, and Nikolay Metodiev Sirakov. 2013. "From Shape to Threat: Exploiting the Convergence Between Visual and Conceptual Organization for Weapon Identification and Threat Assessment." Invited Paper. Recipient of the Lockheed-Martin Best Paper Award. In: Sadjadi, Firooz A. and Abhijit Mahalanobis. Eds. Automatic Target Recognition XXIII. Proceedings of SPIE 0277-768X, V. 8744. Bellingham, WA: SPIE. 87440P. pp. 1-15. doi: 10.1117/12.2015591.

4. Texas A&M System Teaching Excellence Award Recipient 2011;
5. Texas A&M System Teaching Excellence Award Recipient 2011;
6. Chakrader Nara, N.M. Sirakov, 2<sup>nd</sup> Place **TAMU-Commerce** Research Sym. April 01, 2011;
7. *Venkata Nagendra Raja Jadandhyam*, 8th Annual Texas A&M University-System Pathways Research Symposium, West Texas A&M University, October 22-23,2010, **Overall Winner, Master's Level, 2nd Place & 1st Place Winner Mathematics** Discipline, **Title:** Correlation and Shape Matching Methods between Images;
8. *Surendra Chakrader*, 8th Annual Texas A&M University-System Pathways Research Symposium, West Texas A&M University, October 22-23,2010, **Master's Level, 2nd Place, Computer Science, Title:** Enhancement of Skin Lesion Images to Remove Noise.
9. My paper-Heat Equation to 3D Image Segmentation was **Ranked in the top 10% of the papers** Presented on 9th World Multiconference on Systemics, Cybernetics and Informatics (WMSCI 2005).
10. NAU Dept of Mathematics and Statistics annual review committee awarded to me best research for 2001-2002 academic year with grade 4 out of 4; 2002-2003 year with 3.95.

*Commerce, Texas*  
*July 19, 2017*