Curriculum Vitae

Nikolay	Metodiev	Sirakov
First name	Middle name	Surname

Affiliation and official address:
Dept. of Computer Science and Info Systems
Dept. of Mathematics
Texas A&M University Commerce
Commerce, TX 75 429
Ph: (903) 886 5943; Fax: (903) 886 5945; E-mail: **Nikolay_Sirakov@tamu-commerce.edu** ;
URL: http://etsuodt.tamu-commerce.edu/coas/math/FACULTY/SIRAKOV/

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*.

University Education- 1978-1982, Sofia University (SU) "Kl. Ohridsky"- School of Mathematics & Computer Science, *the top Math and Informatics Dept. 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– Associate Prof.	*2010-present;*
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 Assoc. 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,

📖 Northern Arizona University.

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.

1. *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;
   a. Given on Campus poster presentation -*Students Research Symposium* 10.22.05;
   b. Given presentation for the *Pathway Young Research* meeting in Kingsville-November 03-05.2005;
   c. R. Narain, under the supervision of N.M.Sirakov, 2008, Image semantics for indexing of large image databases. Annual Research Symposium 2008, Texas A&M University-Commerce, Thursday April 24, 2008, Best undergraduate presentation – award;
   d. A poster presentation on the Pathway symposium, Nov. 03,2007;
   e. R. Narain, under the supervision of N.M.Sirakov, 2006, 3D objects reconstruction and visualization. SurfDrive, Prairie View Texas A&M Univ., Nov 10-11,2006, **Division Winner CS, Undergraduate**;

2. Will Harrell, Undergraduate student CS Dept, Title: 3D visualization from 2D cross sections, Fall 2007.

3. Bohannon, Derek, Undergraduate student CS Dept, an introduction to 3D visualization, September, October 2006;

4. Minh Tang (SID-342-65-988), Undergraduate student CS Department, *Project:* continuation of coding the Convex Hull algorithm to Image Database Indexing, C++ , Fall 2005, Spring 2006;

5. *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;

6. 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:

1. **Surendra Chakrader Nara -** Dept. CS, Image Enhancement, Active Contours evolving on noise images, **2010-present.**
2. **Jandhyam, Venkata N. –** Dept. CS, Matching Image Regions, Image Correlation, **Spring 2010- present**;
3. **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-Spring 2010**;
4. **Santhus Karapathy –** Dept. of CS, Knowledge extraction from Image Databases, **Fall 2008-Fall2009**;
5. **Prathat Pollisetty: -** Dept. of CS, Completed and optimized the Java code of the Active Convex hull Model, Fall 2008;
6. **Kommu, Shrinivas** 50001262 – Web search and engines, for Content Based Image Retrieval. Google achievements, Spring-Summer 2007, 2D/3D Indexing **Fall2007, Spring Summer 2008;**
7. **Jason Moore,** 10056344, Graduate Student- Dept. of Mathematics, Gradient Methods to Image Enhancement, **Spring 2007;**

8. **Shah, Divyesh** R., 40475793, Graduate Student – Computer Science, *Project:* Data fusion in intelligent systems, Web Archives, DICOM image formats, **Spring 2007;**
9. **Archana Chada** , 50001103, Graduate Student – Computer Science, *Project:* C++ coding of a new active convex hull model, **Spring 2007;**
10. **Sudheer Musini** – Graduate Student CS Department– in the development of the NSF-CAREER proposal, summer 2006;

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, 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;

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 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 SERVICE:
US EXPERIENCE, 2001- Present:
TAMUC-2004 present
- ✓ **Ph.D. program in Computational Science Development Committee-** Spring 2010- present
- ✓ **Development Committee of the new** CS- Professional Science Master's degree in Computational Science – **February 19, 2009, May 2009**, weekly meetings;
- ✓ Defense Committee of the 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 Katsuhiro 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 Undergraduate 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:

Professional Meetings and Conferences 2005 - present:

Title: Automatic Object Identification Using Visual Low Level Feature Extraction and Ontological Knowledge, SDPS'2010- *Society for Design and Process Science*, Dallas, Texas, **June 2009.**

Title: Tracking Neutrophil Cells by Active Contours with Coherence and Boundary Improvement Filter, IEEE SSIAI2010, 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 Computer Science Computer Engineering, and Applied Computing, 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.

TAMUC-2004- present

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, Laboratorie de Reconnaisance 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.

PRESENT RESEARCH ACHIVEMENTS in:

- Automatic skin cancer recognition- **2010 – present;**
- Tracking biomedical objects in video sequences- **2009-present**;
- Emotions recognition through facial features, **started Fall 2008;**
- Steganography- hiding images, **started Fall 2007**;
- 2D/3D active contour models- Image Processing and Analysis;
- Content Based Image Retrieval –in 2D and 3D;
- Features extraction, and indexing in 2D and 3D;
- Scientific Visualization and reconstruction - 2D/3D objects modeling and interpolation;
- Image processing;
- Digital and Multimedia Libraries;
- Computer Vision; Pattern recognition;
- Robot control and vision.

Fields of application: Bio-medical Imaging, Internet, Robotics, Natural Resources.

NAU Dept of Mathematics and Statistics annual review committee evaluated my research for
2001-2002 academic year with max grade 4 out of 4; 2002-2003 academic year with 3.95 out of 4.
FELLOWSHIPS AND GRANTS:

- Competitive Travel Grant by Faculty Development Committee, TAMUC, 2005, 06, 07, **2008**.
- 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.

REVIEWER OF PAPERS: *IN THE US, 2002- Present.*

Journals:

✍ The Journal of Applied Mathematics and Computation, Elsevier Pub., **Impact Factor 1.138, since 2009;**

✍ The Arabian Journal for Science and Engineering, Published in Saudi Arabia, **2009**

✍ Pattern Analysis & Applications Journal, Published by Springer Verlag, Pattern Analysis & Applications Journal, Published by Springer Verlag, **since 2007, Impact Factor 1.367, 2008,** 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 1.367, since 2004**;

✍ IEEE Trans on Signal Processing, one of the top journals in the field of Signal Processing, **Impact Factor 1.2, since 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**.

Conferences:

✍ "Application of Mathematics in Technical and Natural Sciences", June 22-27, 2009, Sozopol, Bulgaria, Euro-American Consortium for Promoting the Application of Mathematics, August **2009;**

✍ IEEE International Conference on Acoustics Speech and Signal Processing, April 2009, Taipei Taiwan, **October-November 2009**;

✍ Signal Processing, Pattern Recognition and Applications (SPPRA 2008/2009/2010,2011), **Innsbruck, Austria;**

✍ The 7th, 8th IEEE International Symposium on Signal Processing and Information Technology"- ISSPIT 2007,**Egypt, August –Sept 2007, Bosnia and Herzegovina, August –Sept 2008.**

✍ The 13th, 14-th 15th IEEE International Conference on Image Processing, ICIP2006,2007,2008, world wide top conferences in the field, **2006,2007,2008,2009**;

✍ The 14th,13-th, 12-th, 11-th, 10-th International Conference on Computer Graphics, Visualization and Computer Vision'2004-2008 – in co-operation with EUROGRAPHICS, **WSCG2004-2011**, Czech Republic.

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.

PUBLICATIONS:
Total number of papers: above 80;
# of papers in reviewed journals, chapter of books, confer.:   above fifty;

Books: two.

Citations: 119. **List of selected citations:**

☞ **IEEE Xplore –** 10 paper are in the server (years: 2010, 2008, 2007, 2006, 2004, 1997);

☞ DBLP Bibliography Server – *eight of my   papers* are listed in the server (years: 2007,2006,2005), Germany, Impact 1.21 out of max 3.31; in the top 15.56% 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 listed as #190 out of 1221;

☞ Sandy A. Napel et al. "Automated Retrieval of CT Images of Liver Lesions on the Basis of Image Similarity: Method and Preliminary Results1", Journal of Radiology, January 2010.

☞ K.S. Arun and K.S. Sarath, 2010, "Evaluation of the Role of Low Level and High Level Features in Content Based Medical Image Retrieval," V. V Das, R. Vijaykumar et al. (Eds.): ICT 2010, CCIS 101, Springer-Verlag Berlin Heidelberg 2010, pp. 319–325, 2010.

 The paper cited: P. Mlsna, **N.M. Sirakov**, **2004**, Intelligent Shape Features Extraction and Indexing System for Fast Medical Image Retrieval, Proc. SSIAI., IEEE Comp Society, US, pp. 172-176, 2004. *ISBN:0-7803-8387*

☞ S. N. Majumdar[1] ✉, A. Comtet[1, 2] ✉, J. R-F[1]Random, "Convex Hulls and Extreme Value Statistics", Journal of Statistical Physics, V. 138, N. 6 / March, 2010, 10.1007/s10955-009-9905-z, pp. 955-1009.
 Articles Cited: the 1st paper from below.

☞ X. Zhang et al., Convex hull properties and algorithms, Applied Mathematics and Computation, Volume 216, Issue 11, 1 August 2010, pp. 3209-3218, (2010), doi:10.1016/ j.amc.2010.04.044

 Articles Cited:- N.M. Sirakov, A new active convex hull model for image regions, Journal of Mathematical Imaging and Vision 26 (2006) 309–325

 - N.M. Sirakov, P.A. Mlsna, Search space partitioning using convex hull and concavity features for fast medical image retrieval, in: Proc. of IEEE, International Symposium on Biomedical Imaging, 2004, pp. 796–799.

☞ Arun K.S1, Hema P Menon, "Content Based Medical Image Retrieval by Combining Rotation Invariant Contourlet Features and Fourier Descriptors", *International Journal of Recent Trends in Engineering,* Vol 2, No. 2, November 2009

☞ Fuzzy skeleton by influence zones—Application to interpolation between fuzzy sets I Bloch - **Fuzzy Sets and Systems, 2008** – Elsevier**, The paper cited is:** Granado, I., **Sirakov, N.,** Muge, F., 2000. A Morphological interpolation approach - geodesic set definition in case of empty intersection. *In John Goutsias, Luc Vincent, Dan S. Blooberg (Eds), Math. Morphology and its Applications to Image and Signal Processing, Kluwer series in computational imaging and vision, Kluwer Academic Publishers*, pp. 71-80. ISBN 0-7923-7862-8

☞ Pornchai Mongkolnam, Thanee Dechsakulthorn and Chakarida Nukoolkit, Extracted Structural Features for Image Comparison, Book Innovations and Advanced Techniques in Computer and Information Sciences and Engineering, Springer Netherlands, Tuesday, **September 04, 2007. The cited paper is on pp**13-17, and the title is: N. Sirakov and P. Mlsna, "Search Space Partitioning using Convex Hull and Concavity Features for Fast Medical Image Retrieval", *IEEE* ISBI, Arlington, VA, Apr. 15-18, 2004;

☞ N. C. Gabrielides , A. I. Ginnis a P. D. Kaklis a, M. I. Karavelas, "G1-smoothBranching SurfaceConstruction fromCross Sections", Preprint submitted to Computer-Aided Design, **11 June 2007. The Paper cited is:** Sirakov NM, Muge FH (2001) "A system for reconstructing and visualising 3D objects." Computers & Geosciences, 27(1):59–69;

☞ 种基于平面地质图的复杂断层三维构建方法侯卫生，吴信才，刘修国，陈国良-岩土力学

 2007-万方数据资源系统 万方数据资源系统. 岩土力学 ROCK AND SOIL MECHANICS

 2007 V.28 No.1 P.169-172. 数字化期刊. **The Paper cited is:** Sirakov NM, Muge FH (2001)

 A system for reconstructing and visualizing 3D objects. Comp & Geosciences, 27(1):59–69;

☞ J. Ponianto, Content-Based Image Indexing, CSE4402-Hons Project, Bachelor of Software Engineering Honours, Computer Science and Software Engineering, Monash University**,**

September 2006. www.csse.**m**onash.edu.au/hons/se-projects/2006/Joel.Ponianto/data/ Literature%20Review.pdf **The Paper cited is:** Mlsna, P., Sirakov, N.M., 2004. An Intelligent Shape Features Extraction and Indexing System for Fast Medical Image Retrieval, *Proc of IEEE* Southwest Symposium on Image Analysis and Interpretation, March 28-30, 2004, pp. 172-176. *ISBN:0-7803-8387-7*

☞ Requirements for Topology in 3D GIS - group of 2 » C Ellul, M Haklay - Transactions in GIS, 2006 - blackwell-synergy.com Page 1. Transactions in GIS, 2006, 10(2): 157–175 © 2006 The Blackwell Publishing Ltd Review Article **...The cited paper is:** An algorithm for 3D groundwater units reconstruction and visualization, **NM Sirakov**, L Ribeiro, P Pina, F Muge - Calibration and Reliability in Groundwater Modeling, Centre …, 2000

☞ Qiang Wu and Hua Xu, A three-dimensional model and its potential application to spring protection, Earth and Environmental Science, V 48, Number 4-5, pp. 551-558, August 2005. **Cited Paper**: Sirakov NM, Muge FH (2001) A system for reconstructing and visualising 3D objects. Comput Geosci 27(1):59–69

☞ JC Felipe, JB Olioti, AJM Traina, MX Ribeiro, A Low-cost Approach for Effective Shape-based Retrieval and Classification of Medical Images, Multimedia, Seventh IEEE International Symposium on, 2005 ; **Paper Cited:** PA Mlsna, NM Sirakov, Intelligent shape feature extraction and indexing for efficient content-based medical image, Image Analysis and Interpretation, 2004. 6th IEEE Southwest, 2004.

☞ J.C. Felipe, AJM Traina, Methods for extraction, comparison and analysis of intrinsic features of medical images, aiming for perceptual content-based retrieval, Brazil, http://netuno.icmc.usp.br/pn/files/2005/Joaquim_Felipe.pdf , **Paper Cited:** the same as above.

☞ Juan Carlos Caicedo, Bibliografa Filtrada, 299629, Septiembre 21 de 2005, http://piccoro.maintask.com/~jckaicedo/un/referencias/filtradas.pdf , #127, **Paper Cited:** Sirakov, N.M. Mlsna. Search space partitioning using convex hull and concavity features for fast medical image retrieval. Biomedical Imaging: Macro to Nano, 2004. IEEE Int. Sym. 2004;

☞ Zhong Gang, China, *Ph.D. Thesis*, in the Field of Reverse Engineering -curve and surface reconstruction from unorganized points, Chinese Language, 2005 http://www.google.com/search?q=N.M.Sirakov&hl=en&lr=&rls=GGLG,GGLG:2005-20,GGLG:en&start=20&sa=N

☞ Wu, Q., Xu, H., Zou, X.K., 2005. An effective method for 3D geological modeling with multi-source data integration. *International Journal Computers & Geosciences* 31 (1), 35–43. 2005.

☞ Xu, C., Dowd, P.A., 2003. Optimal construction and visualisation of geological structures. *International Journal Computers & Geosciences* 29 (6), 761–773. 2005.

☞ Catherine Lichten (McGill University), An Application of the Heat Diff. Eq. to Rapid Edge Detection, NSF sponsored REU, Northern Arizona Univ., report 2003, *two paper are cited;*

☞ Andrey Kislyuk (University of California, Berkeley), Shape Matching In Image Databases, NSF sponsored REU, Northern Arizona University, report 2003, *two paper are cited;*

☞ Valguima V.V.A., Odakura Martinez, Geraldo Lino de Campos; "Image registration of ancient documents", International Conference on Information and Knowledge Engineering - IKE'02, Las Vegas, June 2002. PDF paper: http://www.linodecampos.net/textos/p0202.pdf ;

☞ Valguima V.V.A., Odakura Martinez, Geraldo Lino de Campos, Uma técnica para alinhamento de imagens de documentos antigos, Anais do XII Congresso da Sociedade Brasileira de Computação, Florianópolis, 2002. PDF paper: http://www.linodecampos.net/textos/p0201.pdf;

☞ A, Rosenfeld, Image Analysis and Computer Vision: 1999 , Computer Vision and Image Understanding, Volume 78, Number 2, May 2000, pp. 222-302(81), **Publisher:** Academic Press, **Paper Cited: Sirakov, N.,** 1996. Automatic Reconstruction of 3D Branching Objects. *Volume II Track B, Pattern Recognition and Signal Analysis, Printed by IEEE Computer Society,* Los Alamitos CA, pp.620-624.

AZRIEL ROSENFELD (1931-2004) was a tenured Research Professor, a Distinguished University Professor, and Director of the Center for Automation Research at the University of Maryland in College Park, where he also held affiliate professorships in the Departments of Computer Science, Electrical Engineering, and

Psychology. He held a Ph.D. in mathematics from Columbia University (1957), rabbinic ordination (1952) and a Doctor of Hebrew Literature degree (1955) from Yeshiva University, and honorary Doctor of Technology degrees from Linkoping University, Sweden (1980) and Oulu University, Finland (1994) an honorary Doctor of Humane Letters degree from Yeshiva University (2000), and an honorary degree from the Technion.

☞ Kalcovski, A, Simeonov, I, New Concepts for development of CAD oriented to tailoring, Proc. Int. Conference "Application of Math to Technology and Business, Sozopol, Bulgaria, 1996, pp.310-314, *one paper is cited*;

☞ Yuli Toshev, Biomechanics of human motions, Blagoevgrad, Bulgaria, 1995, ISBN 954-680-013-9, *one paper is cited*.

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 in the proceedings of International and US conferences.

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

MEMBERBERSHIP 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.

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:

➢ IASTED- International Conference on Signal Processing, Pattern Recognition, and Applications (SPPRA), Austria, **2008, 2009,2010,2011**;

➢ 7th, 8th IEEE International Symposium on Signal Processing and Information Technology, ***Cairo, Egypt, December 2007, Bosnia and Herzegovina-December 2008;***

➢ 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/IPCV/ipcv_committee

➢ Program Committee of The 10th World Multiconference on Systemic, Cybernetics and Informatics July, 2006 - Orlando, Florida, http://www.iiisci.org/wmsci2006/website/ProgramCommitte.asp

➢ 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 **2002-present**, in co-operation with EUROGRAPHICS;

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 7th Congress of Theoretical and Applied Mechanics (CTAM), Sofia, *Bulgaria*, September 1993;
➤ Member of the Organizing Committee of the 6th CTAM, Druzba-Varna, *Bulgaria*, September 1989.

Chair of sessions - International Conferences:

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, Insbruck, *Austria*, February, 1992.

RECORD OF RESEARCH PROJECTS:

Image Data Base Queering and Features Extraction: *IN THE US, 2002-Present:*

✍ Automatic skin cancer recognition – **2010.**

✍ Integrating geometric and ontology knowledge for Weapons recognition- **2009- present.**.

✍ Tracking neuthrophil in video sequences **-2010.**

✍ Matching objects boundaries – **2010;**

✍ 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, Fall 2005-present;

✍ 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.

  In Europe:
- ✍ 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:
- ⌨ Facial features extraction and emotions recognition, joint research with Dr. Mariofana Milanova, **CS Dep. University of Arkansas-Little Rock**, **Fall 2008.**
- ⌨ 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.

SUPERVISING SOFTWARE DESIGN AND DEVELOPMENT PROJECTS:

   IN THE US, 2002-Present:

- Expanding active contours for tracking – **2010.**
- Regions matching – **2010.**
- 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.

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, Co-PI Mutlu Mete, CS Dept. *Submitted February 14,2008,* Funded *May 15, 2010, $14,533.*

Title: 3D Segmentation and Features Extraction for 3D Database Indexing, School of Graduate studies, Research Enhancement Grant, **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, 4th 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 - 4th EU Framework, University of *Bologna-Italy,* University of *Granada – Spain*, Instituto Superior Tecnico - *Portugal,* 1996-1998;

- 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 was funded around $1000 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. A*round $ 130 000 per year.*

- Group and differential-geometrical approaches to modeling and control of coupled-body mechanical systems, PI-Clementina Dimitrova Mladenova, 1997-1998.

FEDERAL Initiative- $1,771,964-Title: Integration of low level features and high level ontology knowledge for automatic weapons recognition, *Submitted October 01, 2009.*

NHARP - $147,000- Title: Mathematical and Computer Modeling of Neutrophils Destruction of Bacteria on Medical Implants, Collaborative grant proposal with **Dept. of Mathematics, UT Arlington**-PI Dr. Hristo Kojouharov, **TAMUC**-PI Dr. Nikolay Sirakov, *Submitted Sept. 10, 2009.*

NEH ≈**$250,000- Title:** New Approaches to Digitizing Native American Archival Materials, Milanova Mariofanna - Project Director US – Associate Prof., **Univ. of Arkansas at Little Rock** , Parins James - Associate Director of the **Sequoyah National Research Center**, CO-PI-Little Rock Arkansas , Sarakov Nikolay - Assistant Professor , PI-**Texas A&M University,** Mehdi Qasim-Project Director UK - Professor of the **University of Wolverhampton –UK,** Kountchev Roumen – Professor- Consultant, **Technical University of Sofia, Bulgaria**. *Submitted July 10, 2009.*

NSF, CDI-Type II: Visual Attention Models for Image Exploration, In Collaboration with: PI Assoc. Prof. Mariofna Milanova, U of Arkansas at Little Rock, Derrick Tate, Assistant Professor, Mechanical Engineering Department, Texas Tech University, Ahmed Emam, Assistant Professor, Department of Computer Science, Western Kentucky University, Professor Qasim H. Mehdi, University of Wolverhampton, UK. *Submitted on January 08, 2008,*

NSF CAREER Proposal- CAREER- Title: 2D/3D Dynamic Image Database with Learning Visualization and Tracking,. amount requested $461 342, *Submitted on July 17,2007,* Denied on November 19, 2007 after 6 reviews (3 good; 3 fair) by experts and 2 reviews by NSF panels;

NSF CAREER Proposal- CAREER- Title: Decisions Support-Content Based Image Retrieval System, DS-CBIR**,** amount requested $501,159, *Submitted on July 2006*;

Title: Intelligent Utilities for Brain Cancer's Features Extraction from Image Database, amount requested $96 672, PI Dr. Sirakov, together with Dr. Ye-Lin Ou, *submitted to the Advanced Research Program – Texas, 2007*.

Title: Diagnosis Support-Content Based Image Retrieval System, DS-CBIR amount requested $97000, PI Dr. Sirakov, together with Dr. Simonelli, Dr. Creider, *submitted to the Advanced Research Program – Texas, 2005*.

Title: Automatic Objects Location and Tracking in Image Sequences, together with Dr. Simonelli, amount requested $26850, PI Dr. Sirakov, *Fall 2005, submitted to L-3 Communication;*

Title: 3D Objects Reconstruction and Visualization, amount requested $ 28 075, *Fall 2005, submitted to L-3 Communication;*

Title: Image Database management, features extraction to Content Based Image Retrieval, Dr. Simonelli, amount requested $26850;

Title: Summer Undergraduate Research Program-TAMUC, together with Dr. Allan Headley, Dr. Ken Ashley, Dr. Ben Jang, Fall 2004-Spring 2005, funded for Summer 2005.

In Europe:

Title: Networked Virtual Multimedia Library, Acronym: NeViLib. Participants: RFV-INSA, Lyon, *France,* Ecole Central de Lyon, France; INESC, Lisbon, *Portugal*; IAG, CVRM Instituto Superior Tecnico, Portugal; IM-BAS, *Bulgaria*. Submitted to 5th European Framework – IST program, 2000.

Commerce, Texas   **Signature:…………………….**
October 22, 2010   **(Dr. Nikolay Metodiev Sirakov)**