Boris Gramatikov, Ph.D.

CURRICULUM VITAE

EDUCATION

1984	Ph.D. in Technical Sciences from the Technical University of Sofia, Bulgaria - School of Electronic Engineering and Technology. Ph.D. Thesis: *Electronic Devices for Automatic Processing of Phonocardiographic Signals*. Technical University of Sofia, 1984, UDK 616-7. Central Library of Science and Technology - Sofia, Ref. No. DS 3168.
1973-79	1978 Dipl.-Eng. from the Technical University of Ilmenau, Germany, School of Technical and Biomedical Cybernetics. Major: **Biomedical Engineering and Bionics** (today: Institute of Biomedical Engineering and Informatics). Graduated 1975 Probation training at the (then) Medical Academy, Erfurt, Germany, Department of Audiometry and Acoustic Evoked Potentials 1977 Pre-graduation training at the Regional Hospital, Eisenhuettenstadt, Germany: Instrumentation Design - Impedance Plethysmography; 1977 Clinical Engineering training - Regional Hospital, Eisenhuettenstadt, Germany 1979 Received **Dipl.-Eng.** degree in Biomedical Engineering with *summa cum laude* ("Auszeichnung")
1966-71	English Language High School in Plovdiv, Bulgaria; all subjects taught in English; graduated with honors.

POSITIONS

2021-present	Associate Professor	Laboratory of Ophthalmic Optics, Division of Pediatric Ophthalmology and Adult Strabismus at The Wilmer Ophthalmological Institute, Johns Hopkins University, Johns Hopkins School of Medicine, Baltimore, MD, USA
2003-2021	Assistant Professor	Laboratory of Ophthalmic Optics, Division of Pediatric Ophthalmology and Adult Strabismus at The Wilmer Ophthalmological Institute, Johns Hopkins University, Johns Hopkins School of Medicine, Baltimore, MD, USA
2000	Research Associate	Laboratory of Ophthalmic Optics, Division of Pediatric Ophthalmology and Adult Strabismus at The Wilmer Ophthalmological Institute, Johns Hopkins University, Johns Hopkins School of Medicine, Baltimore, MD, USA
1996 - 2000	Research Associate	Department of Biomedical Engineering, Johns Hopkins University School of Medicine, Baltimore, MD, USA
1995-96	Visiting scientist	Institute of Electronic Circuits (now: The Institute of Electronics, Computer and Telecommunication Engineering), Genova, Italy Fellowship from the Italian Research Council
1993-1994	Visiting scientist	Medical University Hannover, Germany, Institute of Medical Informatics, Department of Biosignal Processing and Biometry A sabbatical sponsored by the Commission for Science and Technological Development of the European Community, DG XII.
1993	Visiting scientist	Department of Biomedical Engineering, Johns Hopkins University - School of Medicine, Baltimore, MD, USA Research visit, sponsored by the Fogarty International Center, NIH, Bethesda, MD.
1986-1988	Visiting scientist	Medical University Hannover, Germany, Institute of Medical Informatics, Department of Biosignal Processing and Biometry Sabbatical sponsored by the German Academic Exchange Service (DAAD)

In the news:

Challenges of Pediatric Fixation Screening and Detection of Amblyopia

Pie Magazine, Issue 2

REVIEWER

Editorial Board appointments (by invitation)

2003- present	*Biomedical Engineering OnLine*
2018-present	*BMC Ophthalmology; since 2018: Associate Editor*

2010- present	*Medical Devices: Evidence and Research*
2015-present	*Journal of Biomedical Engineering and Informatics*
2016-present	*SM Journal of Biomedical Engineering*
2017-present	*EC Psychology and Psychiatry*
2017-present	*Journal of Ophthalmology and Visual Sciences*

Journal peer-review activities with the following journals:

Annals of Biomedical Engineering (Springer)	IF = 2.887 (2015)
IEEE Transactions on Biomedical Engineering (IEEE)	IF = 2.468 (2017)
Nature Photonics	IF = 29.960 (2014)
Nature Scientific Reports	IF = 5.228 (2015)
Biomedical Engineering OnLine (also member of the Editorial Board)	IF = 1.683 (2016)
Journal of Biomedical Optics (SPIE)	IF = 3.40 (2015)
Ophthalmology (Elsevier for the American Academy of Ophthalmology)	IF = 6.750 (2017)
Biomedical Signal Processing and Control (Elsevier)	IF = 1.521 (2017)
Physiological Measurement (IOP Science)	IF = 1.617 (2015)
Journal of Optics A: Pure and Applied Optics (IOP Science)	IF = 1.742 (2015)
Measurement Science and Technology (IOP Science)	IF = 1.352 (2015)
Medical & Biological Engineering & Computing (Springer)	IF = 1.797 (2015)
Optical Engineering (SPIE)	IF = 0.880 (2012)
Optik - International Journal for Light and Electron Optics (IJLEO), Elsevier	IF = 0.677 (2016)
PLOS ONE	IF = 2.806 (2016)
Journal of Electromyography and Kinesiology (Elsevier)	IF = 1.510 (2017)
Medical Engineering & Physics (Elsevier)	IF = 1.819 (2018)
BMC Medical Education (Springer Nature and BioMed Central)	IF = 1.929 (2016)
BMC Ophthalmology (Springer Nature and BioMed Central), Associate Editor	IF = 1.586 (2018)
Journal of Computer and Communications (JCC)	IF= 1.14 (Google)
Computer Methods and Programs in Biomedicine (Elsevier)	IF= 2.840 (2018)
Medical Devices: Evidence and Research (Dove Medical Press / Taylor & Francis) (also Editorial Board member)	
Clinical Ophthalmology (Dove Medical Press / Taylor & Francis Group)	
Journal of Ophthalmology & Visual Sciences /Austin (Editorial Board member)	
Biophysical Reviews and Letters (World Scientific)	
International Journal of Optics (Hindawi)	
Biomedical Instrumentation & Technology (AAMI)	
Transactions on Neural Systems & Rehabilitation Engineering (IEEE EMBS)	
Journal of Biomedical Engineering and Informatics (Sciedu Press)	

Awarded *Recognized Reviewer* status by Elsevier

Invited book reviewer:

"*One-Chip Microcomputers*" by Z. Karakehayov and S. Grigorov (ISBN 954-03-0146)

"*Handbook of Biomedical Optics*", edited by David A. Boas, Constantinos Pitris, and Nimmi Ramanujam. Review published in *BioMedical Engineering OnLine* **11**:7, doi:10.1186/1475-925X-11-7, MS: 1483280662658623, 10 February 2012. http://www.biomedical-engineering-online.com/content/11/1/7

Invited conference reviewer:

The 2nd International Conference on Biomedical Engineering and Biotechnology (ICBEB 2013)
The 4th International Conference on Biomedical Engineering and Biotechnology (ICBEB 2015)
The 5th International Conference on Biomedical Engineering and Biotechnology (ICBEB 2016)
The 6th International Conference on Biomedical Engineering and Biotechnology (ICBEB 2017)
The 7th International Conference on Biomedical Engineering and Biotechnology (ICBEB 2018)
The 40th International Engineering in Medicine and Biology Conference of the IEEE (EMBC 2018)
IEEE International Symposium on Medical Imaging (ISBI 2019)
The Third International Conference on Biological Information and Biomedical Engineering (BIBE 2019)

Invited reviewer for the following Foundations:

Czech Science Foundation
Physicians Services Incorporated (PSI) Foundation
Bulgarian National Science Fund (NSFB)
New Zealand Ministry of Business, Innovation & Employment (MBIE), 2015 Science Investment Round

LANGUAGES: *Fluent in English, German, Bulgarian and Russian*

PROJECTS AND ACHIEVEMENTS

Year	Project	Institution	Role
2012-	Retinal birefringence scanning (RBS) combined with Optical Coherence Tomography (OCT). RBS will be used to provide precise identification of central fixation.	Department of Pediatric Ophthalmology and Adult Strabismus at The Wilmer Ophthalmological Institute, Johns Hopkins Medicine, and Duke University – Departments of Ophthalmology and Biomedical Engineering.	Co-PI
2014-	Eye conjugacy in amblyopic patients	Department of Pediatric Ophthalmology and Adult Strabismus at The Wilmer Ophthalmological Institute, Johns Hopkins Medicine.	
2014-	Optimization of artificial blinking for anti-suppression binocular treatment of amblyopia	Department of Pediatric Ophthalmology and Adult Strabismus at The Wilmer Ophthalmological Institute, Johns Hopkins Medicine.	
2003-present	Building an enhanced version of the Pediatric Vision Screener	Department of Pediatric Ophthalmology and Adult Strabismus at The Wilmer Ophthalmological Institute, Johns Hopkins Medicine	Research Faculty

	Determination of ocular defocus using the double-pass blur image of a point source Building an eye-fixation monitor with no moving parts Improved target for a defocus measuring system Studying the interference of corneal birefringence in retinal birefringence scanning Improving a computer model of retinal birefringence scanning Building an improved early prototype of the 2002 Pediatric Vision Screener Use of retinal nerve fiber layer birefringence in retinal scanning for biometric purposes Development of a Directional Eye Fixation Sensor with no moving parts Use of retinal birefringence scanning for identification of patients with ADHD – pilot project		
1999-2000	Developed an optical fluorescence imaging system for recording of transmembrane action potentials of beating isolated perfused rabbit hearts.	Department of Biomedical Engineering, Johns Hopkins University	Research Project Leader
1999-2000	Developing a portable device for long-term ECG recording and analysis in patients with chest pain - Supported by a Maryland Industrial Partnerships (MIPS) award.	Department of Biomedical Engineering, Johns Hopkins University. A joint project with a company, DVP, Inc. (now InHand Electronics, Inc.)	Co-PI; Designer of the ECG amplifier and data acquisition, ECG analysis algorithms.
1997	Examined *autoregressive methods for differentiation between ventricular fibrillation*	Johns Hopkins University, Baltimore, MD in collaboration with Mid-Carolina Cardiology, Charlotte,	Research Project leader

	caused by different types of stimulation during implantation of ICDs.	NC, supported in part by Medtronic, Inc.	
1996-97	Studied dynamic differences between ventricular fibrillation types	Johns Hopkins University, Baltimore, MD, and the Institute of Electronic Circuits (now: The Institute of Electronics, Computer and Telecommunication Engineering), Genova, Italy	Research Collaborator
1998-99	Developed a computer model of myocardial depolarization under local ischemia. In collaboration with Mahesh Shenai, a graduate student at Johns Hopkins.	Department of Biomedical Engineering, Johns Hopkins University School of Medicine	Project Leader
1997	Studied different *pacing patterns on isolated heart models* (Langendorff preparations)	Department of Biomedical Engineering, Johns Hopkins University, Baltimore, MD	Project Leader
1996-97	Examined *Ischemic changes in isolated Langendorff hearts*.	Department of Biomedical Engineering, Johns Hopkins University, Baltimore, MD	Project Leader
1995-96	Studied the dynamical difference obtained from different simultaneously recorded leads of ECG signals, using the MIT-BIH Arrhythmia Data Base	The Institute of Electronic Circuits (now: The Institute of Electronics, Computer and Telecommunication Engineering), Genova, Italy	Research collaborator
1993-94	A project on Body Surface Mapping (Electrocardiology): Conducted a study on *Reducing the number of leads in body surface potential mapping and Variability of body surface maps in normal patients*.	Medical University Hannover, Germany, Institute of Medical Informatics, Department of Biosignal Processing and Biometry	Independent Project
1993	Worked on detection of ischemic changes in the ECG by means of the Wavelet transform applied to signals from animal models and from human patients before and after PTCA.	Johns Hopkins University School of Medicine, and Johns Hopkins Hospital, Department of Cardiology, Baltimore, MD	Project Leader
1986-87	Developed a technique and a software module for identification of the WPW	Medical University Hannover, Germany, Institute of Medical	Independent Project, Fellowship

	syndrome in the ECG (coding in *Fortran* language)	Informatics, Department of Biosignal Processing and Biometry	
1983-85	Developed algorithms and code for ECG analysis for the Bulgarian microprocessor-based *Interpretive Electrocardiographs with measurement and classification capabilities*), Series 123X, 126X, 331	CLEMA, Medical Academy - Sofia	Part of Ph.D. Thesis
1983-84	Responsible for different hardware support projects for facilitating R&D in biomedical instrumentation: EPROM programmers, floppy disk controllers, A-D converters, microprocessor emulators, asynchronous serial and parallel communications.	CLEMA, Medical Academy - Sofia	Part of Ph.D. Thesis
1980	Developed an enhanced *Microprocessor Development System (MDS) for embedded hardware design*, emulation and programing for 8-bit Motorola microprocessors.	CLEMA, Medical Academy - Sofia	Part of Ph.D. Thesis
1980-85	Designed and built two microprocessor-based devices called PhonoCardioSelectors for automatic signal acquisition and *screening diagnostics of phonocardiographic signals (PCG) in children*. Performed *feature extraction* and developed *diagnostic classification criteria*. (Device coded in Assembly language)	Pediatric Clinic, Medical Academy - Sofia, CLEMA (Biomedical Engineering Department), Medical Academy, Sofia Technical University, Sofia In collaboration with: Prof. Paraskeva Ninova, MD Prof. Ivan Daskalov, D.Sc. Prof. Ivan Dotsinsky, DSc.	Ph.D. Thesis
1978-79	Designed and built *programmable logic for automated experimental investigations of the peripheral nervous system in insects*	Technical University, Ilmenau, Germany	Graduation project

1976	Designed and built a *Two-Channel Impedance Plethysmograph using the 4-electrode principle*.	Technical University, Ilmenau, and Regional Hospital, Eisenhuettenstadt, Germany.	Independent student research project

PATENTS AND INVENTION DISCLOSURES THROUGH THE JOHNS HOPKINS UNIVERSITY:

Name of invention	Inventors	Date of disclosure (priority date)	Date patent was issued or allowed
Method and Apparatus for Detecting Fixation of at least one Eye of a Subject on a Target. **US Patent No. 8,678,592 B2**	**Boris Gramatikov**, David Guyton, Kristina Irsch	March 9, 2012	**Issued on** March 25, 2014
Eye tracking and gaze fixation detection systems, components and methods using polarized light. **US Patent No. 9,737,209 B2**	**Boris Gramatikov**, David Guyton, Kristina Irsch	May 15, 2013	**Issued** on August 22, 2017.
Method and System for Improving Aiming during Optical Coherence Tomography on Young Children by Synchronization with Retinal Birefringence Scanning. **US Patent No. 10,004,397 B2**	**Boris Gramatikov**, David Guyton, Kristina Irsch **(Johns Hopkins University)** Cynthia Toth, Joseph Izatt, Oscar Carrasco-Zevallos **(Duke University)**	Oct 2, 2013	**Issued** on June 26, 2018
Apparatus and Method for Minimizing the Influence of Corneal Birefringence on the Analysis of	Kristina Irsch, David Guyton, **Boris Gramatikov**	March 15, 2013	**Issued**

Eye Fixation and Focus Using Retinal Birefringence Scanning. **US Patent No. 9,713,423 B2**			on July 25, 2017
Eye Alignment Monitor and Method. **US Patent No. 10,314,482**	David Guyton, Howard Ying, Kristina Irsch, **Boris Gramatikov,** R. Geary, J. Tian	Feb 19, 2014	**Issued** on June 11, 2019
Fast X-Y axis Bright Pupil Tracker. **US Patent No. 10,314,843**	**Boris Gramatikov,** David Guyton	Nov 4, 2014	**Issued** on June 11, 2019
Compensating for polarization changes introduced by components with retardation in polarization-sensitive retinal scanning systems. International application (PCT) filed in the US receiving patent office, April 6, 2020; International application number PCT/US20/26840; Attorney docket number P15768-02, EFS ID 39071779; JHU Reference C15768. Provisional patent filed on April 5, 2019 by JHU (P15768-01).	**Boris Gramatikov**, David Guyton	April 5, 2019	pending
Myocardial Ischemia Monitor (invention disclosure to JHU)	Nitish V. Thakor, **Boris Gramatikov**	August 1997	
Ischemia Detection in Implantable Devices (invention disclosure to JHU)	Ananth Natarajan, **Boris Gramatikov**, Nitish V. Thakor	August 1997	

INVITED SPEAKER (Most significant talks)

2019	Schepens Eye Research Institute, Harvard Medical School, Boston, MA, Nov 19, 2019: "Integrating retinal birefringence scanning with OCT for pediatric applications – challenges and solutions"
2018	McPherson Eye Research Institute (MERI) and Laboratory for Optical and Computational Instrumentation (LOCI), University of Wisconsin at Madison, Madison, WI, Sept 10, 2018: "Utilizing the birefringent properties of the human fovea in the design of ophthalmologic diagnostic instrumentation"
2018	Hawaii Center for Advanced Communications, University of Hawaii at Manoa, Honolulu, HI, July 19, 2018: "Signal processing and decision making algorithms in vision screening"
2018	The College of Optics & Photonics (CREOL), University of Central Florida, Orlando, FL, June 29, 2018: "Polarization-sensitive scanning of the retina – from moving to no-moving part designs"
2018	Optical Society of America (OSA) Imaging and Applied Optics Congress, program topic "Imaging Systems and Applications", June 25-27, 2018, Orlando, FL: "Integrating Retinal Birefringence Scanning and Optical Coherence Tomography for Pediatric Retinal Imaging"
2018	Research Institute *Langevin*, Paris, France (affiliated with ESPCI, CNRS, Inserm, and The Sorbonne University): March 26, 2018: "Combining retinal birefringence scanning with long working distance OCT for pediatric applications – challenges and solutions".
2018	Quinze-Vingts Eye Hospital, Centre Hospitalier National D'Ophthalmologie, Paris, France; March 26, 2018: "Retinal-birefringence-scanning-guided optical coherence tomography for imaging in awake pediatric subjects during central fixation".
2018	Department of Medical Engineering and Physics, Guy's King's and St. Thomas' School of Medicine, King's College London, UK; March 21, 2018: "Decision making and classification methods applied to retinal birefringence measurements in vision screening".
2016	Institute of Biophysics and Biomedical Engineering at the Bulgarian Academy of Sciences, and Section of Biomedical Engineering, Union of the Bulgarian Scientists – Sofia, Bulgaria; June 9, 2016: "Detecting vision abnormalities by means of laser scanning of the retina"
2016	Department of Electrical and Computer Engineering, Johns Hopkins University, March 31, 2016: "Detecting vision-related abnormalities in young children using novel ophthalmic instrumentation". Invited lecture.
2016	The Norbert Wiener Center for Harmonic Analysis and Applications, Department of Mathematics, University of Maryland College Park, Feb 18, 2016 "Detecting central fixation by means of retinal birefringence scanning and time-frequency analysis". http://www.norbertwiener.umd.edu/FFT/2016/schedule.html
2013	IEEE Region 2, IEEE Baltimore Section, Engineering in Medicine and Biology Society (EMBS) Chapter and IEEE-USA, Technical Colloquium and Professional Development Seminar: "Using continuous eye fixation monitoring in medical diagnostics – tools and trends"
2013	Annapolis Café Scientifique, Annapolis, MD – "Recent Advances in Biomedical Optics"
2012	Morgan State University, Baltimore, MD - "Polarized Light in Optics, Optoelectronics, Technology and Biomedicine"

2011	IEEE EMB chapter, Technical and Professional Development Seminar at the National Electronics Museum, Baltimore, MD – " Physiological background, optical principles and electronic technologies for tracking eye movements based on foveal information".
2011	IEEE at JHU Distinguished Speaker Seminar Series, Electrical and Computer Engineering (ECE), Johns Hopkins University- Homewood campus, Baltimore, MD – "Detecting eye fixation using retinal information – from biophysics to optoelectronics and instrumentation" http://web.jhu.edu/announcements/faculty-staff/targetpage.html?baid=33913
2011	Four o'clock Afternoon Research Meeting (FARM), Wilmer Eye Institute, Johns Hopkins University School of Medicine, Baltimore, MD – "Central Fixation Monitoring and Gaze Direction Detection using Foveal Birefringence - Physical Principles, Electronic Methods and Signal Processing Techniques"
2010	Medical Grand Rounds, Wilmer Eye Institute, Johns Hopkins University School of Medicine, Baltimore, MD – "Pediatric Vision Screening Instrument for Early Detection of Amblyopia"
2010	Centre of Biomedical Engineering, Bulgarian Academy of Sciences, and Section of Biomedical Engineering, Union of the Bulgarian Scientists – Sofia, Bulgaria – "Use of Birefringence in Medical Optics and Electronics"
2001	IEEE Baltimore Section - "Application of Contemporary Signal Processing and Imaging Methods to Basic Biomedical Research and Clinical Diagnostics"
1997	IEEE Engineering in Medicine and Biology, Baltimore Chapter - "Detection of Coronary Ischemia using Time-Frequency Methods"
1997	Mid-Carolina Cardiology - Charlotte, NC, USA - "Differentiation of Different Ventricular Fibrillation Types in Human Patients, Using Autoregressive Methods"
1996	Institute of Electronic Circuits, Genova, Italy - "Wavelet Analysis for Time Frequency Distributions and Multiresolution Orthogonal Decompositions".
1996	Institute of Physiology, Pisa, Italy - "Wavelets for Time-Frequency Analysis and Detection of Myocardial Ischemia"
1996	University of Heidelberg, Germany - "The Orthogonal Wavelet Transform in Ischemia Detection"
1996	University of Heilbronn, Germany - "Advanced Signal Processing Techniques of the ECG Signal"
1996	Technical University of Ilmenau, Germany - "Time-Frequency Distributions in ECG Analysis"
1993	Technical University of Ilmenau, Germany - "Modern Methods of Computer-Aided ECG Analysis"; "Reducing the Number of Leads in Body Surface ECG Mapping"

MENTORING AT JOHNS HOPKINS UNIVERSITY (Most significant involvement)

Year	Mentee	Mentee's Affiliation	Project	Publications	Awards won
2016	Ivan Gramatikov		Designing and testing a computer-based LCD shutter-glass	1	"Hot Topic" at ARVO 2017 (top 2%)

		Towson University, Baltimore, MD	controller for visual unsuppression in amblyopia		
2015	Shreya Rangarajan	Undergraduate Student Olin College, Needham, MA	1) Attention Attraction in RBS scanning 2) Device for fast pupil tracking	1	
2006-2007	Nicole Frindt	Master Student, University of Heidelberg, Germany	Designing a system for early detection of signs of ADHD using continuous monitoring of the stability of central fixation	1	
2005-2006	Mikael Agopov	Master Student, University of Heidelberg, Germany	Designing a system for retinal scanning for biometric purposes (Security Scanner)	1	
2004-2008	Yi Kai Wu	Development Engineer at Wilmer and Master Student at the Department of Biomedical Engineering	Computer modeling of a system for retinal birefringence scanning (RBS) Developing an optimized opto-mechanical system for improved RBS Developing the control electronics for an RBS system	11	
2004	Elizabeth Bell	Undergraduate Student, Notre Dame College	Near triad activity in presbyopic adults with and without divergence insufficiency. A study using a horizontal eye tracker (pupilometer)		
2003	Kevin Gemp, Elizabeth Bell	Undergraduate students Summer interns	Dynamics of pupil size and accommodation with changing light conditions		

2002-2003	Kevin Nusz	Medical Student, Johns Hopkins School of Medicine	Rapid, objective detection of cataract-induced blur using a bull's eye photodetector.	2	
1997-1998	Anshul Thakral, Louis Stein, Mahesh Shenai	Undergraduate Students, Department of Biomedical Engineering	Efficiency of Anodal Pacing Patterns applied to Isolated Perfused Langendorff Rabbit Hearts	3	Provost Award, JHU
1998-1999	Mahesh Shenai	Undergraduate-Master Student, Department of Biomedical Engineering	Computer Network Modeling of Myocardial Depolarization under normal and ischemic conditions. Feasibility of detecting ischemia from extracellular leads in the vicinity an ischemic spot. Click here for details.	2	Provost Award, JHU Barry Goldwater Award 2000 USA Today's ALL-USA College Academic Second Team
1999-2000	Vivek Iyer	Undergraduate Student Department of Biomedical Engineering	Intra-QRS detection of Ischemia in the European ST-T Data Base. Modeling of Myocardial Depolarization in the presence of Ischemia. Effects of drugs and genes.	2	William R. Kenan Award 1999-2000 Howard Hughes Summer Research Program 2000
1993	Jim Stefansic	Undergraduate Student Department of Biomedical Engineering	Detection of morphologic changes in the ECG with removal of myocardial ischemia by means of PTCA		

AFFILIATIONS

1999-present	**IEEE (The Institute of Electrical and Electronic Engineers)** - The Engineering in Medicine and Biology Society (EMBS) **Member of the IEEE Educational Activities Continuing Education Committee (CEC)** – 2018-present **Member of the IEEE TechEthics Ad Hoc Committee** – 2018-2019 IEEE Continuing Education Collaboration Task Force Member-at-large, IEEE EMBS Technical Committee on "Biomedical Imaging and Image Processing (BIIP)" Vice Chair, EMB Chapter of the IEEE, Baltimore Section – 2016 - present Director for Educational Activities and Continuing Education, Baltimore IEEE Section: Jan 2007 - present Chairman, ExCom, Baltimore IEEE Section: Jan 2006 Vice Chair, ExCom, Baltimore IEEE Section: Jan 2005 Secretary, ExCom, Baltimore IEEE Section: Jan 2004 ExCom member and Treasurer, Baltimore IEEE Section: Jan 2003 Chairman of the Baltimore Chapter of the Engineering in Medicine and Biology Society (EMB-18): Nov 1999 - Dec 2002 Senior Member, IEEE since Nov 2001
2002-present	Association for Research in Vision and Ophthalmology (ARVO)
1997-1999	International Society for Computerized Electrocardiography (ISCE)
1994 -1998	New York Academy of Sciences
1994-1998	American College of Clinical Engineering
1986-1996	International Federation for Medical and Biological Engineering (IFMBE)
1980-1996	Bulgarian National Society of Biomedical Physics and Engineering , Section of Biomedical Engineering 1988-1996 Secretary of the Biomedical Engineering Section

GRANTS and AWARDS

Name	Funding Source	Funding Period	Collaborators
NIH STTR (Small Business Technology Transfer program) A new generation, enhanced, corneal-birefringence-independent retinal scanning device for pediatric vision disorders using polarization modulation Role: PI; Percent effort: 50%	NIH 1R41EY030382-01A1	2019 - 2022	Rebion (David G. Hunter, Justin Shaka, Robert Winsor) David L. Guyton, Johns Hopkins University

The Hartwell Foundation - Biomedical Research Collaboration Award 2012 Imaging Method for Diagnosing Retinal Disease in Infants and Children: Swept Source Optical Coherence Tomography Synchronized with Central Fixation Role: Co-PI with Cynthia Toth, MD, Duke University Percent effort: 50%	The Hartwell Foundation	2012-2015	Co-PI: Cynthia Toth, MD, Professor, Duke University Joseph Izatt, Ph.D., Professor, Duke University David Guyton, MD, Professor, Johns Hopkins University Kristina Irsch, Ph.D, Assist. Prof., Johns Hopkins University.
The Hartwell Foundation Individual Biomedical Research Award 2009 (Boris Gramatikov) Pediatric Vision Screening Instrument for Early Detection of Amblyopia (*Lazy Eye*) Role: PI, percent effort: 50%	The Hartwell Foundation	2010 - 2013	David Guyton, MD, Professor, Johns Hopkins University Kristina Irsch, Ph.D, Assist. Prof., Johns Hopkins University.
Retinal birefringence analysis in strabismus and amblyopia Role: Co-investigator, percent effort: 50%	NIH1R01 EY12883	2000-2003	David G. Hunter, MD, PhD Ophthalmology Children's Hospital Boston
A Portable Physiological Signal Processor, for a Novel Programmable Cardiac Monitor (Phase I and II) Role: Co-Principal Investigator, percent effort: 35%	The Maryland Industrial Partnerships (MIPS)	August 1998 - July 2000	DVP, Inc. (now InHand Electronics, Inc.)
Implantable Myocardial Ischemia Detection Technology Role: Principal Investigator at the time of the award; percent effort: 50%	NIH, 1 R43 HL61995-01A1, SBIR, Phase I	October 1999 - August 2000	Infinite Biomedical Technologies (IBT)
An Optical System for Epicardial Fluorescence Imaging Role: Co-Investigator, percent effort: 10%	NIH, 1 R43 HL61128-01, SBIR, Phase I	October 1999 - July 2000	Infinite Biomedical Technologies (IBT)
An Interactive Two-Dimensional Computer Model of Myocardial Depolarization Role: Co-Investigator	Kenan Fund - Johns Hopkins University, 1999-2000	October 1999 - July 2000	Vivek Iyer, undergraduate student, Johns Hopkins University

OTHER AREAS OF EXPERTISE AND SCIENTIFIC UTTERANCE

Scientific Committee Member and Session Chairman of three international conferences on Biomedical Engineering in Eastern Europe (1985-1989)

Ophthalmology 2017, Las Vegas, NV – member of the Organizing Committee

3rd Global Pediatric Ophthalmology Congress 2018, London, UK – member of the Organizing Committee

The IEEE Engineering in Medicine and Biology Society's (EMBS) 40th International Engineering in Medicine and Biology Conference, Honolulu, Hawaii, July 17-21, 2018. Organizer and chair of Minisymposium "Using lasers and polarization-sensitive technology in retinal scanning/imaging" (July 18, 2018); Associate Editor for Theme 02. "Biomedical Imaging and Image Processing"

International Conference on Biotechnology and Bioengineering 2018 (8th ICBB 2018), Budapest, Hungary – member of the Scientific Committee

International Conference on Medical Imaging and Case Reports, (MICR-2018), 2018, Baltimore, MD, Oct 29-31, 2018,– member of the Organizing Committee

Ophthalmology 2018, 15-16 Nov 2018, Dallas, TX – member of the Organizing Committee and Keynote speaker

The Third International Conference on Biological Information and Biomedical Engineering (BIBE 2019), July 20-22, 2019, Hangzhou, China - member of the Technical Program Committee (TPC)

SCON World Congress on Optics, Photonics and Laser Technologies, June 27-28, 2019, Singapore – member of the Organizing Committee

20th International Conference on Ocular Pharmacology and Eye Care (Eye Care 2019), June 24-25, 2019, Philadelphia, PA – member of the Organizing Committee, Keynote speaker, and Session Chair.

The IEEE Engineering in Medicine and Biology Society's (EMBS) 41st International Engineering in Medicine and Biology Conference (July 23-27, 2019, Berlin, Germany). Organizer and chair of Mini-symposium "Applications of liquid crystal technologies in imaging systems for ophthalmology", Session ThC12, Thursday July 25, 2019, 14:00 h, (Theme 02: "Biomedical Imaging and Image Processing")

2nd International Conference on Medical Imaging and Case Reports, MICR-2019, November 20-22, Boston, MA – member of the Organizing Committee and Keynote speaker.

42nd Annual International Conferences of the IEEE Engineering in Medicine and Biology Society (EMBS) in conjunction with the 43rd Annual Conference of the Canadian Medical and Biological Engineering Society (July 20-24, 2020, Montréal, Québec, Canada). Organizer and chair of Mini-symposium 13: "Emerging biophotonic applications based on, or conjoined with OCT technologies". (Theme 02: "Biomedical Imaging and Image Processing").

International Conference on Lasers, Optics, Photonics & Sensors (LOPS 2020) in Association with the Canadian Academy of Sciences and the Canadian Education Agency Inc. (CAS). June 12-14, 2021 (virtual), FL. Scientific Committee member and key speaker.

International Conference on Lasers, Optics, Photonics & Sensors, Biophotonics and ultrafast nonlinear optics (LOPS 2022) June 10-12, 2022, Ft. Lauderdale, FL. Scientific Committee member and key speaker.

FELLOWSHIPS, AWARDS, DISTINCTIONS and Certificates

2018	The 2018 Meritorious Achievement Award in Continuing Education from the IEEE Educational Activities Board (EAB) https://ieeexplore.ieee.org/document/8632839 https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8632839 (IEEE Transactions on Education, Vol. 62, No. 1, February 2019, p.67) http://www.boris-gramatikov.net/Gramatikov_2018_IEEE%20EAB%20Award.html
2018	The 2017 Outstanding Professional Award of IEEE Region 2 (8 eastern US states) of the Institute of the Electric and Electronic Engineers (IEEE).“For extensive engineering achievements and innovative contributions to the theory, design and validation of advanced diagnostic devices for cardiology and pediatric ophthalmology” http://www.boris-gramatikov.net/Gramatikov_2018%20IEEE%20R2%20Award.html
2012-2015	The Hartwell Foundation 2012 Biomedical Research Collaboration Award (with Cynthia Toth from Duke University)
2010-13	The Hartwell Foundation 2009 Individual Biomedical Research Award
2007-2012	Certificates for contributions as Director for Continuing Education and Educational Activities of the Baltimore Section of IEEE
2006	Certificate for contributions as a Chair of the Baltimore Section of IEEE
2005	Certificate for contributions as a Vice Chair of the Baltimore Section of IEEE
2004	Certificate for contributions as a Secretary of the Baltimore Section of IEEE
2003	Certificate for contributions as a Treasurer of the Baltimore Section of IEEE
2000-2002	Certificates for contributions to IEEE as a Chairman of the Baltimore Chapter of IEEE Engineering in Medicine and Biology Society (EMBS)
1996	An award by the Italian CNR (Consiglio Nazionale di Richerche) for a two-week visit to a research collaborator at the Institute of Circuits and Systems, Genova, Italy
1993	Fellowship by the Fogarty International Center, NIH: a 4-month exchange visit to the Biomedical Engineering Department of the Johns Hopkins University - School of Medicine, Baltimore, MD
1993	Fellowship by DG XII-B, Research and Development, Commission of the European Communities: a 7-month research visit to the Medical University Hannover, Germany, Institute of Medical Informatics, Department of Biosignal processing.
1985	Fellowship by the German Academic Exchange Service (DAAD): sabbatical (4 months) at the Department of Biosignal processing, Medical University Hannover, Germany.
1978	A Distinction (Auszeichnung) upon graduating the Technical University of Ilmenau, Germany
1977	A gold medal "For Excellent Studies" from the Bulgarian Committee for Science, Technical Progress and Higher Education, handed by the Bulgarian Ambassador to Germany in Berlin, Germany

1977	A Testimonial for excellent studies from the Bulgarian Embassy, Berlin, Germany
1976	Third prize - Second Scientific Review of the Bulgarian undergraduate and and graduate students in Germany, Berlin
1971	A gold medal upon graduating from the English Language School - Plovdiv, Bulgaria

SEMINARS / SPECIAL TRAINING

Autonomous Vehicles (7-hour online course), IEEE Continuing Education and ILN, June 2021

Enterprise Blockchain in Healthcare, IoT, Energy and Supply Chain, IEEE Continuing Education (4-hour course), Feb 1, 2020

Edge Computing, IEEE Continuing Education (4-hour course), May 18, 2019

Global Cybersecurity Trends and Practices (Terry Thompson), IEEE Continuing Education (4-hour course), Jan 20, 2018

Compliance Basics – 2018 (Online, Nov 30, 2017, Johns Hopkins University)

Supervisor Anti-Harassment & Title IX (EDU-US) (Online, July 31, 2017, Johns Hopkins University)

Compliance Basics – 2017 (Online, Dec 12, 2016, Johns Hopkins University)

Scholarly Publishing Symposium (Johns Hopkins University and Elsevier, Nov 9, 2016, Mountcastle Auditorium and Welch Library)

Conflict of Interest and Commitment (Sept 19, 2016)

Preparing for an active shooter in the clinical and non-clinical environment (JHU online), (May 17, 2016)

Design and Analysis of Embedded Automotive Networks (Sekar Kulandaivel), IEEE Continuing Education (4-hour course), March 26, 2016

Drones - Principles, Components, Design and Control (Jonathan McGee, Duy Tang), IEEE Continuing Education (4-hour course), Feb 6, 2016

Training and practice of unlicensed Clinical Research Stuff (online), June 2, 2015

Android Programming for Mobile Device. (B. Fashola) IEEE Continuing Education (4-hour course), March 21, 2015

Time Management: How to Create 5 Extra Hours a Week for Your Use. JHU (David Yousem), April 17, 2013

Intro to iOS App Development. (J. Curtis), IEEE Continuing Education (4-hour course), April 13, 2013

Feedforward Neural Networks: Theory & Applications. (Fred Chen), IEEE Continuing Education (4-hour course), National Electronics Museum, Feb 2, 2013

Negotiation Skills: The key to consensus and conflict resolution. JHU (Heather Williams), Oct 11, 2012

Effective Meetings in Half the Time. JHU (Ray Perry), Sept 27, 2012

The Value of Art and Science of Systems Engineering and Project Management on Project Development Projects. IEEE, National Electronics Museum, (Ayman Nassar), Feb 25, 2012

Your Best Year Ever: Managing Your Mission and Sense of Yourself, JHU (S. Robinson), Jan 19, 2012

Preparing your CV for Promotion, Johns Hopkins University, Dec 21, 2011

Old Scripting languages still Useful: A demonstration of AWK and Perl. (Bob Webber), IEEE Continuing Education (4-hour course), Dec 10, 2011

Speak Like a Pro: Part One, Johns Hopkins University (Karen Storey), Dec 2, 2011

Java Programming: A Crash Course in the Basics (Marty Hall), IEEE Continuing Education (4-hour course), April 9, 2011.

Crucial Conversations, Johns Hopkins University (Linda Dillon Jones), March 17, 2011

Developing Hard-Real Time Embedded Systems (Kim Fowler), IEEE Continuing Education (4-hour course), Nov 13, 2010
Assertive Communications, Johns Hopkins University (Virginia Jacobs), Oct 14, 2010
E-mail Etiquette Seminar, Johns Hopkins University (Eric Vohr), May 20, 2010
Communicating With Others, Johns Hopkins University (Virginia Jacobs), May 3, 2010
Grantcraft Workshop, JHU (Vogel/Maloney/Linehan/Reese/Cheng), March 10, 2010
A Program of Advanced Circuit Design: PCB Design Fundamentals Using HDI (High Density Interconnect) (Dan Smith), IEEE Continuing Education (three 4-hour courses): Jan 9, 2010, Feb 27, 2010, March 27, 2010.
Introduction To Advanced PWB Design (D. Smith / H. Holden), IEEE Continuing Education (4-hour course), Nov 21, 2009
Catching up with Computer Software (C-programming course) (Edward R. Byrne), IEEE Continuing Education (4-hour course), Oct 3, 2009.
FPGAs - What, Why, Where, & How. (Brian Hoey from Altera), IEEE Continuing Education (4-hour course), March 29, 2009
Conquering Negativity: Creating Optimism in the Workplace. JHU, (Mark Hankerson), March 24, 2008
Developing Real-Time, Embedded Products (Kim Fowler), IEEE Continuing Education (two 4-hour courses): Jan 6 and Jan 13, 2007
How to Be an Effective Mentee in a Mentoring Relationship. JHU, (Derek Haseltine and Lisa Heiser), Nov 15, 2006
MATLAB for Image Processing (MathWorks IP01 2-day course), Columbia, MD, 2005
Real-Time and Embedded Computing Conference, The RTC Group, Martin's Crosswinds, 2004
Effort Reporting. Web-based course, Johns Hopkins University, 2004.
Conflict of Interest and Commitment. Web-based course, Johns Hopkins University, 2003.
Ophthalmology for the Pediatrician. Conference, Johns Hopkins University, 2000.
Human Subjects Research. Web-based course, Johns Hopkins University, 2000.
Clinical Trials. Conference, Johns Hopkins University, 1999.
Essential Business Writing Skills. Seminar, Johns Hopkins University, 1999.
Grant Writing. Seminar, Johns Hopkins University, 1997 and 2001
Clinical Engineering, International Workshop, ACCE/AAMI Meeting, Boston, 1993
Medical Device Marketing. Short course, WHO/Bulgarian Ministry of Health, Sofia, 1992
Authority and Leadership. Group-Dynamics School, The Free German University, Berlin (West), 1989

HOBBIES

Piano, sailing, windsurfing, skiing, tennis, photography, swimming, digital audio recording and sound editing

CONTACT INFORMATION

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Publications

Book chapter

1. Nitish V. Thakor, Boris Gramatikov and David Sherman. Wavelet (Time-Scale) Analysis in Biomedical Signal Processing. In The Biomedical Engineering Handbook, Ed. Joseph Bronzino, 2nd Edition., Volume I, Section VI (Biomedical Signal Analysis), Chapter 56, pp. 56-1 – 56-27. CRC Press LLC, IEEE Press, December 1999.
   http://www.crcnetbase.com/doi/abs/10.1201/9781420049510.ch56 (1999, chapter 56)
   http://www.crcnetbase.com/doi/abs/10.1201/9781420003864.ch5 (2006, chapter 5)

PUBLICATIONS IN PEER-REVIEWED JOURNALS

2. Gramatikov, B.I. A Mueller matrix approach to flat gold mirror analysis and polarization balancing for use in retinal birefringence scanning systems. *Optik – International Journal of Light and Electron Optics* (Elsevier), Vol. 207, April 2020, 164474, First online: Feb 25, 2020.
   https://doi.org/10.1016/j.ijleo.2020.164474
   https://www.sciencedirect.com/science/article/abs/pii/S0030402620303089

3. Gramatikov, B.I. Computer-aided fixation detection using retinal birefringence in multi-modal ophthalmic systems: Computer, electronics, algorithms. *Computers in Biology and Medicine* (Elsevier), Vol. 119, April 2020, 103672, First online: Jan 1, 2020;
   https://doi.org/10.1016/j.compbiomed.2020.103672
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4. Gramatikov, B.I. A method of calculating compensators in polarization-sensitive optical systems. *Optik – International Journal of Light and Electron Optics* (Elsevier), Vol. 201, Jan 2020, 163474. Available online: 2019-09-30 *, DOI: 10.1016/j.ijleo.2019.163474*
   https://www.sciencedirect.com/science/article/pii/S0030402619313725?dgcid=author
   https://jhu.pure.elsevier.com/en/publications/a-method-of-calculating-compensators-in-polarization-sensitive-op

5. Gramatikov, B.I. Detecting central fixation by means of artificial neural networks in a pediatric vision screener using retinal birefringence scanning. *BioMedical Engineering OnLine* (Springer)*,* Open Access, First online: 27 April 2017*.* DOI: 10.1186/s12938-017-0339-6.
   http://link.springer.com/article/10.1186/s12938-017-0339-6
   https://biomedical-engineering-online.biomedcentral.com/articles/10.1186/s12938-017-0339-6

6. Gramatikov, I.B., Simons, K., Guyton, D.L., Gramatikov, B.I. A PC-based shutter glasses controller for visual stimulation using multithreading in LabWindows/CVI. *Computer Methods and Programs in Biomedicine* (Elsevier)*,* 143 (2017), 151-158. Uploaded online on 10 March 2017.
   https://www.ncbi.nlm.nih.gov/pubmed/28391813

https://www.sciencedirect.com/science/article/abs/pii/S0169260716313074?via%3Dihub
http://www.cmpbjournal.com/article/S0169-2607(16)31307-4/pdf
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7. Gramatikov, B.I., Guyton, D.L. A no-moving-parts sensor for the detection of eye fixation using polarised light and retinal birefringence information. *Journal of Medical Engineering & Technology* (Taylor & Francis), **41**, No.4, pp.249-256. Published online: 26 Jan 2017; DOI: 10.1080/03091902.2017.1281357.
   https://www.ncbi.nlm.nih.gov/pubmed/28122478
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8. Gramatikov, B.I., Rangarajan, S., Irsch K, Guyton, D.L. Attention attraction in an ophthalmic diagnostic device using sound-modulated fixation targets. *Medical Engineering and Physics* (Elsevier), **38**, No.8, August 2016; pp. 818-821, doi information: 10.1016/j.medengphy.2016.05.004.
   https://www.ncbi.nlm.nih.gov/pubmed/27245750
   http://dx.doi.org/10.1016/j.medengphy.2016.05.004
   http://www.medengphys.com/article/S1350-4533(16)30085-6/pdf
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9. Gramatikov, B.I., Irsch K, Wu Y-K, Guyton, D.L. New Pediatric Vision Screener - Part II. Electronics, Software, Signal Processing and Validation. *BioMedical Engineering OnLine* (Springer); First online: 04 February 2016. Open Access.
   http://link.springer.com/article/10.1186%2Fs12938-016-0128-7
   http://biomedical-engineering-online.biomedcentral.com/articles/10.1186/s12938-016-0128-7
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10. Gramatikov, B. I. Detection of central fixation using short-time autoregressive spectral estimation during retinal birefringence scanning. *Medical Engineering & Physics* (Elsevier), September 2015, 37(9), pp. 905–910; 10.1016/j.medengphy.2015.06.007,
    http://dx.doi.org/10.1016/j.medengphy.2015.06.007
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11. Gramatikov, BI, Irsch, K, and Guyton, D. Optimal timing of retinal scanning during dark adaptation, in the presence of fixation on a target: the role of pupil size dynamics. Journal of Biomedical Optics, 2014, 19(10), 106014. doi:10.1117/1.JBO.19.10.106014.
    http://biomedicaloptics.spiedigitallibrary.org/article.aspx?articleid=1921066%20&journalid=93
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12. Gramatikov, B.I., Iyer, V. Intra-QRS Spectral Changes Accompany ST Segment Changes During Episodes of Myocardial Ischemia. Journal of Electrocardiology, 2015; 48(1):115-122, doi: 10.1016/j.jelectrocard.2014.09.005, PII: S0022-0736(14)00353-7.
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13. Irsch,K., Gramatikov,B.I., Wu, Y. K., Guyton,D. L. New pediatric vision screener employing polarization-modulated, retinal-birefringence-scanning-based strabismus detection and bull's eye focus detection with an improved target system: Opto-mechanical design and operation. Journal of Biomedical Optics, 2014, Jun 1;19(6):67004. doi: 10.1117/1.JBO.19.6.067004.
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14. Gramatikov, B. Modern Technologies for retinal Scanning and Imaging. An Introduction for the biomedical Engineer." An invited review, Biomedical Engineering OnLine, 2014, 13:52; DOI: 10.1186/1475-925X-13-52. Published April 29, 2014.
http://www.biomedical-engineering-online.com/content/13/1/52

15. Irsch, K, Gramatikov, B.I., Wu, Y-K, Guyton, D.L. Improved eye-fixation detection using polarization-modulated retinal birefringence scanning, immune to corneal birefringence. Optics Express, 22(7):7972-7988, published on 18 March 2014, DOI:10.1364/OE.22.007972,
http://www.opticsinfobase.org/oe/abstract.cfm?uri=oe-22-7-7972
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16. Gramatikov, B. Detecting fixation on a target using time-frequency distributions of a retinal birefringence scanning signal. BioMedical Engineering OnLine 2013, 12:4. Published on May 13, 2013. doi:10.1186/1475-925X-12-41
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17. Gramatikov,B., Irsch,K., Müllenbroich,M., Frindt,N., Qu,Y., Gutmark,R. Wu,Y.-K., Guyton, D. A Device for Continuous Monitoring of True Central Fixation Based on Foveal Birefringence. Annals of Biomedical Engineering, Vol. 41, Issue 9 (1 Sept 2013), pp. 1968-1978. Also Epub ahead of print: May 4, 2013. DOI: 10.1007/s10439-013-0818-2. PMID: 23645511.
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http://www.ncbi.nlm.nih.gov/pubmed/18327275
https://www.osapublishing.org/ao/abstract.cfm?URI=ao-47-8-1048

20. Gramatikov B.I., Zalloum O.H.Y., Wu Y.K., Hunter D.G., Guyton D.L. A Directional Eye Fixation Sensor Using Birefringence-Based Foveal Detection. Applied Optics, Vol. 46, Issue 10, pp. 1809-1818, April 2007.
https://www.osapublishing.org/ao/abstract.cfm?uri=ao-46-10-1809

21. Gramatikov B.I., Zalloum O.H.Y., Wu Y.K., Hunter D.G., Guyton D.L. Birefringence-based eye fixation monitor with no moving parts. Journal of Biomedical Optics, 2006, 11(3), May-June, pp. 034025-1 - 034025-11.
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41. Gramatikov, B., Ivanov, E. Using triacs for programmed intensity control of electric light sources Radio, Television and Electronics (in Bulgarian language), No. 7, 1985, pp.33-34, UDK 621.382

INVITED BOOK REVIEWS

42. Gramatikov, B. Book review: "Handbook of Biomedical Optics", edited by David A. Boas, Constantinos Pitris, and Nimmi Ramanujam. BioMedical Engineering OnLine 11:7, doi:10.1186/1475-925X-11-7, MS: 1483280662658623, 10 February 2012.
http://www.biomedical-engineering-online.com/content/11/1/7

SHORT PAPERS IN CONFERENCE PROCEEDINGS AND NEWS MAGAZINES

43. Irsch,K., Gramatikov,B.I., Wu, Y. K., Guyton, D. L. "A Novel Pediatric Vision Screener Employing Wave-Plate-Enhanced, Retinal-Birefringence-Scanning-Based Strabismus Detection and Double-Pass Focus Detection" Conference Paper. Imaging Systems and Applications, Arlington, VA, USA, June 23-27, 2013, Section Medical II (ITh2D). In Imaging and Applied Optics © OSA 2013, J. Christou and D. Miller, eds., OSA Technical Digest (online), paper ITh2D.5. Available through OpticsInfoBase (OSA's Digital Library, Optical Society of America, 2013).
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44. K. Irsch, B. I. Gramatikov, Y.-K. Wu, and D. L. Guyton: "Spinning wave plate design for retinal birefringence scanning." SPIE conference on Advanced Biomedical and Clinical Diagnostic Systems VII, San Jose, CA (Jan 2009). Proc of SPIE 7169, 71691F1-12.
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ABSTRACTS - NORTH AMERICAN AND EUROPEAN CONFERENCES

48. Gramatikov, B. "Biophotonic technologies for advanced eye diagnostics". 2nd International Conference on Medical Imaging and Case Reports, MICR-2019, November 20-22, 2019, Boston, MA.

49. Gramatikov, B. "Using liquid crystal variable retarders as phase compensators in retinal birefringence scanning". The IEEE Engineering in Medicine and Biology Society's (EMBS) 41st International Engineering in Medicine and Biology Conference (July 23-27, 2019, Berlin, Germany), Minisymposium "Applications of liquid crystal technologies in imaging systems for ophthalmology", Session ThC12, Theme 02: "Biomedical Imaging and Image Processing".

50. Gramatikov, B. "Novel equipment for identifying and treating strabismus and amblyopia ("lazy eye") in pediatric patients". Eye Care 2019, Philadelphia, PA

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* The above citations do not include a) citations before 1993; b) citations in Bulgarian journals, books and dissertations, or c) citations in German dissertations.

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