**Education**

* 1963-1968, M.S. (Ing). – Slovak Technical University, Bratislava, Slovak Republic
* 1972-1977, Faculty of Natural Sciences, Comenius University, Bratislava, RNDr. (Rerum Naturalis Doctor) in *numerical methods in mathematics* -1982
* 1972-1977, CSc. (Candidate of Sciences, equivalent to PhD degree) – in *measurement science*, Institute of Measurement Theory, Slovak Academy of Sciences, Bratislava (PhD. nostrification in1998)

**Academic qualification**

* 2005 – Doc. (docent – equivalent to Associated Professor) in *Telecommunications*, Faculty of Electrical Engineering and Information Technology, Slovak University of Technology, Bratislava
* 2010 – Prof. (Full Professor) in *Measurement Science*, Faculty of Electrical Engineering and Information Technology, Slovak University of Technology, Bratislava

**Affiliation and functions**

* 1974-1977 researcher, Institute of Measurement Theory, Slovak Academy of Sciences (SAS), Bratislava, Slovak Republic (SR)
* 1977-1980 scientist, Joint Institute of Nuclear Research (JINR), Dubna, USSR
* 1980-1982 scientist, Institute of Measurement, Slovak Academy of Sciences, Bratislava, SR
* 1982-1998 senior scientist, Institute of Measurement Science, Slovak Academy of Sciences, Bratislava, SR
* 1998-2010 principal scientist, Austrian Research Centers GmbH, Seibersdorf, Austria
* 2010- principal scientist, Institute of Measurement Science, Slovak Academy of Sciences, Bratislava, SR
* 1986-1997 Head of the Digital Image Processing Department, Institute of Measurement Science, Slovak Academy of Sciences, Bratislava, SR
* 1991-1997 Scientific secretary of the Institute of Measurement Science, Slovak Academy of Sciences, Bratislava, SR
* 1990-1997 member of the Scientific Committee of the Institute of Measurement Science, Slovak Academy of Sciences, Bratislava, SR
* 2001- (part time) Faculty of Electrical Engineering and Information Technology, Slovak University of Technology, Bratislava, SR

**Supervised international research projects**

* 1983-1985, *Research and development of filmless system of information acquisition from streamer chambers*, *6-230-0621-79/83,*Joint Institute of Nuclear Research, Dubna, USSR
* 1984-1986, *Building and further development of the system for filmless information acquisition in physical experiments, 6-220-0763-84/ 86,*Joint Institute of Nuclear Research, Dubna, USSR
* 1986-1990, *Computer graphics and evaluation of scientic calculations*, *6-219-0830-86/90,*Joint Institute of Nuclear Research, Dubna, USSR
* 1983-1986, *Automatized systems of digital image processing,* Institute of Measurement Science, Slovak Academy of Sciences and Institute of Information Transmission Problems, Academy of USSR, Moscow, USSR
* 1991-1933, *3D Diagnoscope,* OWP-51, Gz.: 45208*/*1-27b*/*91, Institute of Measurement Science, Slovak Academy of Sciences and Institute of Information Processing, Austrian Academy of Sciences, Wien, Austria
* 1994-1997, *Selective 3D smoothing and segmentation of MR tomograms,* OWP-148, Ost-West Program of Austrian Government
* 1999-2001, *Gel Image Analysis* - *GELmaster*, Innovation labs, Austrian Research Centers (ARCS) Seibersdorf
* 2001-2002, *Extension of the functionality and applicability of the Gel Image Analysis*, Program of competitive research, CCVI-1.87.00116, ARCS Seibersdorf
* 2004-2006, *GASepo-Gel Image Analysis system for Epo doping analysis,* WADA (World Anti-Doping Agency) grant, ARCS Seibersdorf, Institute of Measurement Science, SAS (subproject)
* 2007-2008, *E-CVI-Advanced inspection technologies in security printing* (1.87.00138), grant of the ARCS Seibersdorf
* 2008-2009, *Application potential of Hierarchical Temporal Memory- a new paradigma of intelligence*, FA-Forschung grant, ARCS Seibersdorf.

**Supervised national research projects**

* 1986-1990, *Methods and means for image processing in MR tomography*, project ŠPZV III-9-4/02-2
* 1986-1989, *Development of mathematical methods and software tools of DIP systems in biomedical experiments*, project 2.2.2.8.3 within the complex program-2000, VTP-RVHP
* 1991-1993, *Digital image processing and its usage in medical diagnostics*, project GA SAV 3/ 91
* 1993, *Filtering of MR tomograms using geometry-driven diffusion*, EC-project  PECO, ERB-CIPA-CT-92-2030
* 1994-1997, *Selected methods of acquisition, processing and 3D visualization of* *tomograms*, project VEGA 2/1016/ 94
* 1995-1998, *Development of computer and mathematical methods of acquisition, processing and visualization of information from biomedical measurement*, project VEGA 95/5305/468
* 1999-2001, *Nonlinear methods of adaptive filtering and segmentation of MR images based on geometry-driven diffusion*, project VEGA 2/6017/99
* 2010-2012, *Novel methods of classification and prediction in analysis of biosignals and biologically inspired computer vision*, project VEGA 2/0019/10.

**Awards**

* 1987, Award of the Slovak Academy of Sciences (a member of the research team of NMR tomography, Institute of Measurement Science, SAS)
* 1995, Silver honorable plaquette of Aurel Stodola in technical sciences
* 2001, ARCAWARD-for science, project: „Gel image analysis" (head of the international team)
* 2003, ARCAWARD- for science, project: „GASepo-system for Epo doping control" (head of the scientific part of the international team)

**Research stays abroad**

* 1981 Laboratory of Numerical Methods and Automation, JINR Dubna (3 months)
* 1985 Universities in Rome, Neapol, Genova and Florence, supported by „Consiglio Nazionale delle Ricerche" (1 month)
* 1987 University of Toronto, supported by „National Science and Engineering Research Council of Canada" (1 month)
* 1992 Aristotle University Thessaloniki (1 month)
* 1993 Fraunhofer Institute for Medical Devices, St.Ingbert, EU-grant (3 months)
* 1999 Hertha Firnberg Fellowship in ARCS Seibersdorf (2 years)

**Pedagogic activity**

*Lectures and excercises at the Faculty of Electrical Engineering and Information Technology, Slovak University of Technology, Bratislava :*

* 1989-1990 Fundamentals of Digital Image Processing (DIP)
* 1993,1997 Biomeasurement
* 2001-2004,2005-2010 Selected Algorithms of DIP (SA DIP)

**Research interests**

* Nonlinear filtering and segmentation of images in biomedicine
* Pattern recognition and detection of visual objects based on the methods of non-negative matrix factorization and other vector subspace methods
* Biologically inspired computer vision
* Invariant representation of visual information using a network model of Hierarchical Temporal Memory (HTM)
* Classification problems of biosignals and image objects using the network model of HTM and models of visual attention
* Theoretical and algorithmic problems of compressed sensing/sampling of multidimensional signals.

**Publications : 2000-2011**

*Chapters in foreign monographs*

1. BAJLA, I. – HOLLÄNDER, I. – WITKOVSKÝ, V.: Task-based evaluation of image diffusion filtering algorithms. Chapter 5 (pp.89–115): „Empirical Evaluation Methods in Computer Vision”, Christensen, H.I., Phillips, P.J., World Scientific Press, New Jersey, London, Singapore, Hong Kong, 2002, Series “Machine Perception and Artificial Intelligence”, 159 pp.
2. BAJLA, I. – SOUKUP, D.: Is the parts-based concept of NMF relevant for object recognition tasks? Chapter 17 (pp.463–471): „Machine learning research progress“, Peters, H., Vogel, M., NOVA Science Publishers, New York, 2010, 480 pp.
3. BAJLA, I. – SOUKUP, D. – ŠTOLC, S.: Occluded image object recognition using localized non-negative matrix factorization methods. Chapter 6 (pp.83–106): „Object recognition“, Tam Phuong Cao, InTech open access publisher, Rijeka, 2011, 350 pp.

*Papers in international journals indexed by CC, ISI-WoS*

1. BAJLA, I. – HOLLÄNDER, I.: Locally adaptive conductance in geometry–driven–diffusion filtering of magnetic resonance tomograms. IEE Proceedings – Vision, Image and Signal Processing, 2000, 147, N. 3, 271–282.
2. BAJLA, I. – HOLLÄNDER, I.: Geometry–driven–diffusion filtering of magnetic resonance images using model–based conductance. Machine Vision and Applications, 2001, 12, N. 5, 223–237.
3. FÜRTLER, J. – MAYER, K. – KRATTENTHALLER, W. – BAJLA, I.: SPOT––development tool for software pipeline optimization for VLIW–DSPs used in real–time image processing. Real–Time Imaging 9, 2003, 387–399.
4. BAJLA, I. – HOLLÄNDER, I. – FLUCH, S. – BURG, K. – KOLLÁR, M.: An alternative method for electrophoretic gel image analysis in the GelMaster software. Computer Methods and Programs in Biomedicine, 2005, N. 77, 209–231.
5. BAJLA, I. – HOLLÄNDER, I. – GMEINER, G. – REICHEL, Ch.: Quantitative analysis of images in erythropoietin doping control. Medical and Biological Engineering and Computing, 2005, 43, N.3, 403–409.
6. BAJLA, I. – HOLLÄNDER, I. – MINICHMAYR, M. – GMEINER, G. – REICHEL, Ch.: GASepo – a software solution for quantitative analysis of digital images in Epo doping control. Computer Methods and Programs in Biomedicine, 2005, 80, 246–270.
7. ŠTOLC, S. – BAJLA, I.: Improvement of band segmentation in Epo images via column shift transformation with cost functions. Medical & Biological Engineering & Computing, 2006, 44, N. 4, 257–274.
8. BAJLA, I. – Rublík, F. – Arendacká, B. – Farkaš, I. – HORNIŠOVÁ, K. – ŠTOLC, S. – Witkovský, V.: Segmentation and supervised classification of image objects in Epo doping–control. Machine Vision and Applications, 2009, 20, 243–259.
9. BAJLA, I. – HOLLÄNDER, I. – Czedik–Heiss, D. – GRANEC, R.: Classification of image objects in Epo doping control using fuzzy decision tree. Pattern Analysis and Applications; 2009, 12, 285–300.

*Papers in international journals*

1. SOUKUP, D. – BAJLA, I.: Robust object recognition under partial occlusions using NMF. Computational Intelligence and Neuroscience, 2008, Article ID 857453, 14 pp, 2008, doi: 10.1155/2008/857453. <http://www.hindawi.com/journals/cin/2008/857453.html>
2. ŠTOLC, S. – Bajla, I.: On the optimum architecture of the biologically inspired hierarchical temporal memory model applied to the hand–written digit recognition, invited paper, Measurement Science Review, 2010, 10 (2), 28–49, (DOI:10.2478/v10048–010–0008–4): <http://versita.metapress.com/content/0253453l03347251/fulltext.pdf>
3. BAJLA, I. – HOLLÄNDER, I. – BURG.K.: Improvement of Electrophoretic Gel Image Analysis, Measurement Science Review, 2001, N. 1, Section 2: <http://www.measurement.sk/Papers3/Bajla.pdf>
4. BAJLA, I. – HOLLÄNDER, I. – KOLLÁR, M.: Novel algorithms implemented in the gel image analysis system GAS2. Measurement Science Review, 2003, 3, 57–66. Section 2: <http://www.measurement.sk/2003/S2/Bajla.pdf>.
5. BAJLA, I. – HOLLÄNDER, I. – WITKOVSKÝ, V.: Performance evaluation method for geometry–driven diffusion filters. Journal of Electrical Engineering, 54, N. 1–2, 2003, 3–12.
6. Heiss–Czedik, D. – Bajla, I.: Using Self–organizing maps for object classification in Epo image analysis. Measurement Science Review, 2005, 5, 11–16. Section 2: <http://www.measurement.sk/2005/S2/Heiss.pdf>.
7. ŠTOLC, S. – Bajla, I.: Improved accuracy of band detection in GASepo system for quantitative analysis of images in Epo doping control. Measurement Science Review, 2007, 7, 14–18, Section 1, (ISSN 1335–8871): <http://www.measurement.sk/2007/S1/Stolc.pdf>

*Invited papers published in proceedings of international conferences*

1. BAJLA, I.–HOLLÄNDER, I.–HEISS, D.–GRANEC, R.–MINICHMAYR, M: Object classification in images for Epo doping control based on fuzzy decision trees. In: Proc. of the Int. Conference Electronic Imaging, Applications of Neural Networks and Machine Learning in Image Processing IX, San Jose, USA, SPIE Vol.5673, Nasser M.Nasrabadi, Syed A.Rizvi (eds), 42–56, 2005, SPIE and IS&T – 0277–786X/05.

*Papers in peer-reviewed proceedings of international conferences*

1. BAJLA, I. – HOLLÄNDER, I.– WITKOVSKÝ, V.: Task–based evaluation image diffusion filtering algorithms. In: Proc. of the 2nd Workshop on Empirical Evaluation Methods in Computer Vision organized in conjunction with the ECCV 2000, Dublin, 26 June–2 July, 55–76.
2. PENZ, H. – BAJLA, I. – VRABL, A. – KRATTENTHALER, W. – MAYER, K.: Fast real–time recognition and quality inspection of printed characters via point–correlation. In: Proc. of SPIE 4303, Int. Conference on Real–Time Imaging V, 24–25 January, 2001, San Jose, USA, 127–137.
3. BAJLA, I. – HOLLÄNDER, I. – BURG.K.: A study on DNA–Gel image analysis improvement. In: Proc. of the 3rd Int. Conference on Measurement MEASUREMENT`2001, 14–17 May, 2001, Smolenice castle, Slovak Republic, 223–226.
4. BAJLA, I. – HOLLÄNDER, I. – BURG.K, – FLUCH, S.: A novel approach to quantitative analysis of electrophoretic gel images of DNA fragments. In: Proc. of the IEEE Int. Symposium on Biomedical Imaging 2002, 7–12 July, Washington, 899–902, (CD ROM).
5. BRODERSEN, J. – MAYER, K.J. – LANDL, D. – BAJLA, I.:Novel data acquisition and communication bus architecture for real–time multisensor imaging systems. In: Proc. of the Int. Conference Real–Time Imaging IV, Santa Clara, January, 2003, SPIE 5012, 122–131.
6. FÜRTLER, J. – MAYER, K.J. – KRATTENTHALER, W. – BAJLA, I: Novel development tool for software pipeline optimization for VLIW–DSPs used in real–time image processing. In: Proc. of the Int. Conference Real–Time Imaging IV, Santa Clara, January, 2003, SPIE 5012, 132–143.
7. BAJLA, I. – HOLLÄNDER, I. – GMEINER, G. – REICHEL, Ch.: Analysis of EPO Images after isoelectric focusing and double blotting. In: Proc. of the 2nd IASTED Int. Conference BIOMED04, 16–18 February, 2004, Innsbruck, Austria. Paper N.417–164, 228–233, (CD ROM).
8. HOLLÄNDER, I. – BAJLA, I. – MINICHMAYR, M. – GMEINER, G. –REICHEL, Ch.: GASEPO–System for Analysis of Images generated in EPO Doping Control. In: Proc. of the BIOSIGNAL‘2004 Int. Conference, Brno, 23–25 June, 2004, 273–277.
9. RAMOSER, H. – BIBER, J. – BAJLA, I. – HOLLÄNDER,I.: Segmentation of Electrophoretic Images in Doping Control. In: Proc. of the METMB‘04 Int. Conference, Las Vegas, 21–24 June, 2004, CSREA Press, 2004, (ISBN 1–932415–43–2), 467–470.
10. HOLLÄNDER, I. – BAJLA, I. – MINICHMAYR, M. – GMEINER, G. – REICHEL, Ch.: GASepo: System for analysis of images generated in EPO doping–control proteomics. In: Manfred Donike workshop (23d Cologne workshop on Dope Analysis) Platform, 2005, Cologne, Germany, 4 pp.
11. ŠTOLC, S. – BAJLA, I.: Improvement of band classification in GASepo system used in EPO Doping–Control. In: Proc. of the 18th Biennal Int. EURASIP Conference BIOSIGNAL 2006, Brno, Czech Republic, 27–29 June, 2006, Brno University of Technology and EURASIP, (eds): J. Jan, J. Kozumplík and I. Provazník, VUTIUM Press, 2006, 281–283.
12. BAJLA, I. – SOUKUP, D.: Non–Negative matrix factorization: a study on influence of matrix sparseness and subspace distance metrics on image object recognition. In: SPIE Proc. of the Int. Conference on Quality Control by Artificial Vision 2007, Le Creusot, France, 23–26 May, 2007, SPIE Vol.6356, Bellingham, Washington, USA, 2007, 14/1–14/12.
13. BAJLA, I.– SOUKUP, D.: A modular non–negative matrix factorization for parts–based object recognition using subspace representation. In: SPIE Proc. of the Int. Conference Electronic Imaging, San Jose, CA, USA, January, 2008, (eds): Kurt S.Niel, and David Fofi, SPIE Vol. 6813, 68130C–1, 9 pp.
14. Štolc, S.– Bajla, I.: Image object recognition based on biologically inspired hierarchical temporal memory model and its application to the USPS database. In: Proc. of the 7th Int. Conference on Measurement 2009, Smolenice, Slovak Republic, 20–23 May, 2009, VEDA, Publisher SAS, (eds): M. Tyšler, J. Maňka, and V. Witkovský, 23–27.
15. ŠTOLC, S.– BAJLA, I.: Application of the computational intelligence network based on hierarchical temporal memory to face. In: Proc. Of the 10th IASTED Int. Conference on Artificial Intelligence and Applications AIA 2010, Innsbruck, Austria, 15–17 February, 2010, 674–042, 185–192, ACTA Press, (ed) M. H. Hamza.
16. ŠTOLC, S.– BAJLA, I. – VALENTÍN, K. – ŠKOVIERA, R. : Temporal pooling method for rapid HTM learning applied to geometric object recognition, In: Proc. of the 8th Int. Conference on Measurement, Smolenice, Slovak Republic, 27–30 April, 2011, IMS SAS Smolenice, (eds): J.Maňka, V.Witkovský, M.Tyšler, I.Frollo, 59-64.

*Posters at international conferences*

1. BAJLA,I. –HOLLÄNDER,I. –KOLLÁR,M: The second generation of the image analysis system GAS for electrophoretic DNA gels. In: Proc. of the 4th Int. Conference Measurement 2003, Smolenice, Slovak Republic, 2003, IMS SAS Bratislava, (eds): I. Frollo, M. Tyšler, and A. Plačková, 252–255.
2. Štolc, S.– Bajla, I.: Improvement of band classification in GASepo system used in EPO Doping–Control. In: Proc. of the 18th Biennal Int. EURASIP Conference BIOSIGNAL 2006, Brno, Czech Republic, 27–29 June, 2006, Brno University of Technology and EURASIP, (eds): J. Jan, J. Kozumplík, and I. Provazník, VUTIUM Press, 2006, 281–283.
3. Bajla, I.– SOUKUP, D.: Non–Negative matrix factorization: a study on influence of matrix sparseness and subspace distance metrics on image object recognition. In: SPIE Proc. of the Int. Conference on Quality Control by Artificial Vision 2007, Le Creusot, France, 23–26 May, 2007, SPIE Vol. 6356, Bellingham, Washington, USA, 2007, 14/1 – 14/12.
4. HOLLÄNDER, I. – BAJLA, I.– MINICHMAYR, M. – GMEINER, G. – REICHEL, Ch.: GASepo: System for analysis of images generated in EPO doping–control proteomics. In: 2nd Int. Symposium of the Austrian Proteomics Platform, Seefeld, Austria, 2005.
5. HOLLÄNDER, I. – BAJLA, I.–– GMEINER, G. – REICHEL, Ch. –MINICHMAYR, M.: epoCAM: A system for chemiluminescence image acquisition in doping control. In: Proc. of the 5th Int. Conference Measurement 2005, Smolenice, Slovak Republic, 15–19 May, 2005, IMS SAS Bratislava, (eds): I. Frollo, M. Tyšler, and V. Juráš, 190–193.
6. HOLLÄNDER, I. – GMEINER, G. – REICHEL, Ch – BAJLA, I.– MINICH–MAYR, M. : GASepo: The Three years of a successful WADA Project. In: Int. conference “Say No to Doping”, Bucharest, Romania, National Anti–Doping Agency of Romania, 8–11 November, 2006.
7. ŠTOLC, S. – BAJLA, I.: Improved accuracy of band detection in GASepo system for quantitative analysis of images in Epo Doping Control. In: Proc. of the 6th Int.Conference on Measurement 2007, Smolenice, Slovak Republic, 20–24 May, 2007, VEDA, Publisher SAV, (eds): I. Frollo, J. Maňka, and V. Juráš, 21–25.

*Patents*

1. BAJLA, I. –HOLLÄNDER: Patentanmeldung AT 501 961: „Verfahren und Einrichtung zur Auswertung von Bildern I“. Austrian patent AT 501 961, awarded 15 December, 2006.
2. BAJLA, I. –HOLLÄNDER: Patentanmeldung 1236/2002: „Verfahren und Einrichtung zur Auswertung von Bildern II“. Austrian patent AT 501 962, awarded 15 December, 2006.
3. BAJLA, I. –HOLLÄNDER: Patentanmeldung A 223/2004: „Verfahren zur Analyse von Bandenbildern (Doping–kontrolle) “. Austrian patent 500963, awarded 15 May, 2006.