

# Curriculum Vitae

## Personal Information:

Name: Szilvia Balla-S. Béla  
Place and Date of Birth: Tata, Hungary, 24. September 1983.  
Nationality: Hungarian

## Contact Information:

Office: Department of Geometry, Institute of Mathematics  
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## Studies:

2002-2007 Studies of Mathematics at Faculty of Natural Sciences  
Budapest University of Technology and Economics (BUTE), Budapest  
Field of interest: Geometry, Algebra, Operations Research  
Title of Thesis: *Geometrical methods for NC tool-path generation*  
14.06.2007 University Diploma with Honors - M.Sc.in Mathematics  
2007 - 2011 Doctoral studies in Mathematics,  
Department of Applied Geometry, Johannes Kepler Universität (JKU), Linz  
Field of research: applied geometry, CAGD, algebraic geometry,  
root finding methods for multivariate polynomial systems  
Title of Dissertation: *Fat Arcs and Fat Spheres for Approximating  
Algebraic Curves and for Solving Polynomial Systems*  
20.05.2011 Phd. in Mathematics

## Positions:

2005-2007 Tutor at the Department of Geometry, Institute of Mathematics, BUTE, Hungary  
2007-2008 Research assistant in project SFB013, Linz, Austria  
2008-2011 PhD Student, Doctoral Program „Computational Mathematics”, Linz, Austria  
2011-2012 Teaching assistant at Department of Geometry, BUTE, Budapest, Hungary  
2012- Assistant professor at Department of Geometry, BUTE, Budapest, Hungary

## Collaboration with other institutes, internship:

2009. Febr.- March Galaad Group, INRIA, Sophia Antipolis, France  
2010. April- May Department of Mathematics, Technical University of Denmark,  
Lyngby, Denmark

## Languages skills:

Hungarian (native), English (C1), German (B2)

## Publications:

M. SZILVÁSI-NAGY, SZ. BÉLA AND GY. MÁTYÁSI: *About the geometry of milling paths*, *Annales Mathematicae et Informaticae*, 2008, **35**, 135–146.

M. SZILVÁSI-NAGY, GY. MÁTYÁSI AND SZ. BÉLA: *Geometric simulation of locally optimal tool paths in three-axis milling*, *Journal for Geometry and Graphics*, submitted in Dec 2012.

SZ. BÉLA AND B. JÜTTLER, *Fat arcs for implicitly defined curves*, *Mathematical Methods for Curves and Surfaces*, 2010, Springer, *Lecture Notes in Computer Science*, **5862**, 26–40.

SZ. BÉLA AND B. JÜTTLER, *Approximating Algebraic Space Curves by Circular Arcs*, *Curves and Surfaces – Avignon*, 2010, Springer, *Lecture Notes in Computer Science*, **6920**, 157–177.

SZ. BÉLA, *Fat Arcs and Fat Spheres for Approximating Algebraic Curves and for Solving Polynomial Systems*, Dissertation (supervisor: Univ.-Prof. Dr. Bert Jüttler), 2011.

SZ. BÉLA AND B. JÜTTLER, *Real Root Approximation Using Fat Spheres*, *Reliable Computing Journal*, Special Issue on the Use of Bernstein Polynomials in Reliable Computing: A Centennial Anniversary Polynomials, Vol. 17. pp. 72-96.

M. SZILVÁSI-NAGY AND SZ. BÉLA, *B-spline patches fitting on surfaces and triangular meshes*, *KoG, Information Journal of Croatian Society of Constructive Geometry and Computer Graphics*, 2011, **15**, No. 15., 17–24.

M. SZILVÁSI-NAGY AND SZ. BÉLA, *B-spline patches constructed from inner data*, *Proceedings of Sixth Hungarian Conference on Computer Graphics and Geometry*, Budapest, 2012, 30–34.

M. SZILVÁSI-NAGY AND SZ. BÉLA, *Stitching B-Spline Curves Symbolically*, *KoG, Information Journal of Croatian Society of Constructive Geometry and Computer Graphics*, 2013, **17**, 3–8.

M. SZILVÁSI-NAGY, GY. MÁTYÁSI AND SZ. BÉLA, *Geometric Simulation of Locally Optimal Tool Paths in Three-Axis Milling*, *Journal for Geometry and Graphics*, 2013, **17**, No.2. 223–235.

P. JUHÁSZ, SZ. BÉLA AND K. KOPECSKÓ, *Mathematical analysis of capillary elevation in porous limestone*, *Építőanyag*, Budapest, 2013, **65**, No.1. 2–5.

SZ. BÉLA AND M. SZILVÁSI-NAGY, *General Matrix Representation of B-Splines and Approximation of B-Spline Curves and Surfaces with Third Order Continuity*, *Proceedings of Seventh Hungarian Conference on Computer Graphics and Geometry*, Budapest, 2014, 1–6.

## Conference Talks:

*About the geometry of milling paths*, 7<sup>th</sup> International Conference on Applied Informatics, Eger, Hungary, January 29–31, 2007

*About the geometry of milling paths*, Conference on Geometry: Theory and Applications, Vorau, Austria, June 3–8, 2007

*About the geometry of milling paths*, 2.International Symposium, Stuttgart, Germany, June 28–29, 2007

Participant at Annual DAAD project workshop 2007, Belgrade, Serbia, September 20–22, 2007

*Approximating implicitly defined curves by fat arcs*, FSP Workshop, Strobl, Austria, March 26–28, 2008

*Approximating implicitly defined curves by fat arcs*, Seventh international conference on mathematical methods for curves and surfaces, Tønsberg, Norway, June 26 - July 1, 2008,

*Approximating implicitly defined curves by fat arcs*, 4th International Conference on Symbolic and Numerical Scientific Computing, Hagenberg, Austria, July 24–26, 2008,

*Approximating implicitly defined curves by fat arcs*, DK Kick-Off Meeting, Strobl, Austria, October 1–3, 2008,

*Fat arcs for implicitly defined curves*, SAGA Autumn school 2008, Castro Urdiales, Spain, November 17–21, 2008,

*Computing with Fat Arcs*, DK-Statusseminar, Pichl, Austria, July 7–10, 2009,

*Algebraic Curve Approximation with Circular Arcs*, DK-Statusseminar, Linz, Austria, March 11, 2010,

*Fat Arcs for Algebraic Space Curves*, Seventh International Conference on Curves and Surfaces, Avignon, France, June 24–30, 2010,

*Computing with Fat Arcs and Fat Spheres*, DK-Statusseminar, Strobl, Austria, October 6–8, 2010,

*Fat Arcs and Fat Spheres for Approximating Algebraic Curves and for Solving Polynomial Systems*, DK Seminar, Linz, Austria, January 20, 2011,

*Bounding Algebraic Curves by Fat Arcs*, Conference on Geometry - Theory and Applications, Vorau, Austria, June 23, 2011,

*Fat Arcs and Fat Spheres for Bounding Curves and Solving Polynomial Systems*, - Poster Presentation, Vilnius, Lithuania, September, 2011,

*Numerical Computation of Parallel and Central Projections*, - Workshop lecture (common work with M. Szilvasi-Nagy), Rijeka, Croatia, 3-7. September 2012,

*Approximation of B-Spline Curves and Surfaces Using Matrix Representation*, - International Conference on Applied Informatics, Eger, Hungary, 30. January 2014,

*General Matrix Representation of B-Splines and Approximation of B-Spline Curves and Surfaces with Third Order Continuity*, - Seventh Hungarian Conference on Computer Graphics and Geometry, February 19-21, 2014, Budapest, Hungary,

*Merging B-spline curves or surfaces using matrix representation*, - Constructive Geometry Conference, Sopron, Hungary, October 21-22, 2014,

2022. január 27., Budapest