

# Károly Bezdek

Professor - Canada Research Chair (Tier 1) in Computational and Discrete Geometry  
University of Calgary - Department of Mathematics and Statistics  
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## 1 Education

1978: M.Sc. (Diploma) in Mathematics, Eötvös Loránd University, Budapest, Hungary  
1980: Ph.D. (Dr.rer.nat.) in Mathematics, Eötvös Loránd University, Budapest, Hungary  
1985: C.Sc. (Candidate of Science) in Mathematics, Hungarian Academy of Sciences, Budapest, Hungary  
1995: D.Sc. (Doctor of Science) in Mathematics, Hungarian Academy of Sciences, Budapest, Hungary  
1997: Dr.habil. (Habilitation) in Mathematics, Eötvös Loránd University, Budapest, Hungary

## 2 Academic Work - Duties

### 2.1 Eötvös Loránd University (ELTE), Budapest, Hungary: 1978-2002

Bezdek has been a faculty member of the Department of Geometry at ELTE between 1978-2003. In particular, he has worked there as Research Assistant (Aug., 1978 - July, 1980), Teaching Assistant (Aug., 1980 - Dec., 1982), Assistant Professor (Jan., 1983 - June, 1989), Associate Professor (July, 1989 - June, 1998), **Széchenyi Professor** (Jan., 1998 - Jan., 2002: a distinguished professorship awarded by the Hungarian government), and **Full Professor** (July, 1998 - June, 2003). Last but not least, between Oct., 1999 - June, 2003 he has been the **Chair** of the Department of Geometry at ELTE. In chronological order, he was the **7th chair** of the Department of Geometry with a list of chairs including a number of world class mathematicians such as Béla Kerékjártó (topology, foundation of geometry, projective geometry), László Fejes Tóth (discrete geometry), and György Hajós (geometry of numbers, foundation of geometry). Bezdek has **served on** a number of decision making **scientific committees**, including the Mathematical Board of the Hungarian Academy of Sciences, the Science Committee of the Hungarian Ministry of Education, and the Mathematical Committee of the Hungarian National Science Foundation. During the period of 1978 - 2003, while being on a number of special leaves from ELTE, Bezdek has held numerous **visiting professor positions** at research institutions **in Canada, Germany, the Netherlands, and United States**. This included a period of **7 years at the Department of Mathematics of Cornell University** in Ithaca, New York.

### 2.2 The University of Calgary (U of C), Calgary, Canada: 2003 -

From July, 2003 Bezdek is a **professor of mathematics** and **Canada Research Chair (Tier 1) of computational and discrete geometry** at the Department of Mathematics and Statistics of the University of Calgary and is the **director** of the Center for Computational and Discrete Geometry (CCDG) at the University of Calgary (U of C). He is one the few longest serving Canada Research Chairs in Canada having a third seven-year term. The **Fejes Tóth lectures series, started by Bezdek** in 2009, brought to U of C a number of world class mathematicians, whose visits generated important joint research works. The refereed e-journal **Contributions to Discrete Mathematics (CDM)** is dedicated to publishing significant results in a number of areas of pure and applied mathematics. **Bezdek has started CDM** in 2006 and since then he has been serving as a Co-Editor-in-Chief of CDM. Between 2004-2007 Bezdek was a **member** of the Scientific Advisory Board, as well as of the Program Committee of the **Banff International Research Station (BIRS)**. Between July - December, 2011, Bezdek was a program and scientific committee **co-chair of the 6 month thematic program**, on discrete geometry and its applications, **at the Fields**

**Institute for Research in Mathematical Sciences** in Toronto. This was a major international event for discrete geometry, that brought to Toronto more than 400 researchers. From July, 2010 Bezdek is a **Titulary Professor** at the Department of Mathematics of the University of Pannonia in Veszprém, Hungary.

### 3 Recent Awards

*June 19, 2015:* The "**2015 Fejes Tóth Prize**" was awarded by University of Pannonia, Veszprém, Hungary.

*Aug 3, 2016:* The "**Great Supervisor Award**" was awarded by the Faculty of Graduate Studies at U of C.

*May 15, 2017:* The "**2017 Life-Time Achievement Research Excellence Award**" was awarded by the Faculty of Science at U of C.

### 4 Research Work and Selected Publications (10 research papers and 1 book)

Bezdek's main field of research is **convex and discrete geometry**, which is a rapidly developing discipline on the boundary of mathematics and computer science. **He has over 130 research publications including 4 books.** "Google Scholar" (<https://scholar.google.ca>) posts **more than 2100 citations** to Bezdek's publications. The following selected publications of Bezdek reflect the **fruitful interplay between geometry, linear algebra, geometric analysis, and combinatorics** and demonstrate some **breakthroughs**.

[134] K. Bezdek, *On uniform contractions of balls in Minkowski spaces*, *Mathematika*, Volume 66, Issue 2 (2020), Pages 448-457.

[116] K. Bezdek, *Lectures on Sphere Arrangements - the Discrete Geometric Side*, *Fields Institute Monographs*, Volume 32, Springer, New York, 2013 (198 pages).

[107] K. Bezdek, *Illuminating spindle convex bodies and minimizing the volume of spherical sets of constant width*, *Discrete and Computational Geometry*, Volume 47, Issue 2 (2012), Pages 275-287.

[103] D. Bezdek and K. Bezdek, *Shortest billiard trajectories*, *Geometriae Dedicata*, Volume 141, Issue 1 (2009), Pages 197-206.

[101] K. Bezdek and A. E. Litvak, *Covering convex bodies by cylinders and lattice points by flats*, *Journal of Geometric Analysis*, Volume 19, Issue 2 (2009), Pages 233-243.

[97] K. Bezdek, Zs. Lángi, M. Naszódi and P. Papez, *Ball-polyhedra*, *Discrete and Computational Geometry*, Volume 38, Issue 2 (2007), Pages 201-230.

[80] K. Bezdek and R. Connelly, *Pushing disks apart - the Kneser-Poulsen conjecture in the plane*, *Journal für die reine und angewandte Mathematik* Volume 553 (2002), Pages 221-236.

[79] K. Bezdek, *Improving Rogers' upper bound for the density of unit ball packings via estimating the surface area of Voronoi cells from below in Euclidean  $d$ -space for all  $d \geq 8$* , *Discrete and Computational Geometry*, Volume 28 (2002), Pages 75-106.

[59] A. Bezdek and K. Bezdek, *A solution of Conway's fried potato problem*, *Bulletin of the London Mathematical Society*, Volume 27 (1995), Pages 492-496.

[37] K. Bezdek, *The problem of illumination of the boundary of a convex body by affine subspaces*, *Mathematika*, Volume 38 (1991), Pages 362-375.

[16] K. Bezdek, *Circle-packings into convex domains of the Euclidean and hyperbolic plane and the sphere*, *Geometriae Dedicata*, Volume 21 (1986), Pages 249-255.

### 5 Current Members - Center for Comput. and Discrete Geom.

**Undergraduate Research Student:** B. Strachan (May-August, 2019) and (May-August, 2020)

**Ph.D. students:** I. Ivanov (2018- ), N. Robock (2019- )

**Researchers:** T. Bisztriczky, T. Dinh, F. Fodor, C. Laflamme, J. Ling, K. Seyffarth, R. Woodrow, Y. Zinchenko