

# António Manuel Bandeira Barata Alves de Araújo

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Universidade Aberta

António Manuel Bandeira Barata Alves de Araújo

PERSONAL INFORMATION

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WORK EXPERIENCE

2003–2011 **Mathematics lecturer**  
Aberta University, Lisbon (Portugal)

2011–Present **Assistant Professor (Mathematics)**  
Aberta University, Lisbon (Portugal)

EDUCATION AND TRAINING

12/1995 **BSc. in Physics**  
University of Lisbon, Lisbon (Portugal)

10/1999 **MSc. in Mathematics (Geometry and Topology)**  
University of Lisbon, Lisbon (Portugal)

06/2011 **Ph.D. in Mathematics**  
University of Lisbon, Lisbon (Portugal)

PERSONAL SKILLS

Mother tongue(s) Portuguese

Foreign language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
French	B2	C1	B2	B2	B1
Italian	B1	B1	B1	B1	A2
Spanish	C1	C1	C1	C1	B1
Japanese	A2	A2	A2	A2	A2

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user  
Common European Framework of Reference for Languages - Self-assessment grid

Organisational / managerial skills

Vice-coordinator and member of the scientific commission of the Digital Media Arts Ph.D. programme at Aberta University, Portugal (2018-present)

Coordinator of the BSc. programme in Applied Mathematics at Univ. Aberta (2018)

Vice-coordinator of the MSc. programme in Mathematics and applications (2018)

Digital skills

SELF-ASSESSMENT				
Information processing	Communication	Content creation	Safety	Problem-solving
Proficient user	Proficient user	Proficient user	Proficient user	Proficient user

Digital skills - Self-assessment grid

Experienced programmer in several languages: java, scheme, javascript, processing, Rebol, Mathematica, Singular, R. Have taught javascript + three.js programming and computer graphics at the undergraduate level. Taught R courses at the undergraduate level. Co-author of a programme of computer graphics algorithms course at the graduate level. Lead developer of the Cadavre Exquis interactive film software. Developer of the Eq A Sketch 360 immersive drawing program (see list of publications).

ADDITIONAL INFORMATION

Memberships

Jan. 2017 – present: Researcher at *Research Center for Arts and Communication* (CIAC), University of Algarve, Portugal. Researching on the connections between mathematics and the visual arts, both traditional and digital. Mostly working on anamorphosis and curvilinear perspectives.

Jan 2011 – Dec. 2017: Researcher at *Center for Mathematics and Fundamental Applications* (CMAF), Lisbon, Portugal.

Researcher in Geometry (mostly Algebraic/analytic Geometry/Singularity Theory). Worked in classification problems/dessingularization of Lagrangian/Legendrian curves and surfaces.

Member of the Unione Italiana di Disegno

Member of Ludus, Association for Recreational Mathematics

Publications (Scientific)

In scientific journals:

A. B. Araújo, “Explorations in Rational Drawing,” *Journal of Mathematics and the Arts*, vol. 14, no. 1–2, pp. 4–7, Apr. 2020, doi: [10.1080/17513472.2020.1734437](https://doi.org/10.1080/17513472.2020.1734437).

A. Araújo and P. Serranho, “On the use of quasi-equidistant source points over the sphere surface for the method of fundamental solutions,” *Journal of Computational and Applied Mathematics*, vol. 359, pp. 55–68, Oct. 2019, doi: [10.1016/j.cam.2019.03.019](https://doi.org/10.1016/j.cam.2019.03.019).

A. B. Araújo, “Ruler, compass, and nail: constructing a total spherical perspective,” *Journal of Mathematics and the Arts*, vol. 12, no. 2–3, pp. 144–169, 2018, doi: [10.1080/17513472.2018.1469378](https://doi.org/10.1080/17513472.2018.1469378).

A. B. Araújo, “Drawing equirectangular VR panoramas with ruler, compass, and protractor,” *Journal of Science and Technology of the Arts*, vol. 10, no. 1, pp. 2–15, 2018, doi: [10.7559/citarj.v10i1.471](https://doi.org/10.7559/citarj.v10i1.471).

A. B. Araújo, “Topologia, anamorfose, e o bestiário das perspectivas curvilíneas,” *Convocarte–Revista de Ciências da Arte*, no. 2, pp. 51–69, 2016.

A. Araújo and O. Neto, “Limits of tangents of quasi-ordinary hypersurfaces,” *Proceedings of the*

*American Mathematical Society*, vol. 141, no. 1, pp. 1–11, 2013.

A. Araújo and O. Neto, “Moduli of germs of legendrian curves,” in *Annales de la Faculté des sciences de Toulouse: Mathématiques*, 2009, vol. 18, pp. 797–809.

#### **in Conference Proceedings:**

António Bandeira Araújo, Lucas Fabián Olivero, Sara Antinozzi: HIMmaterial: Exploring new hybrid media for immersive drawing and collage. ARTECH 2019: 9th International Conference on Digital and Interactive Arts; 10/2019, DOI:10.1145/3359852.3359950

António B. Araújo: Eq A Sketch 360, a Serious Toy for Drawing Equirectangular Spherical Perspectives. ARTECH 2019: 9th International Conference on Digital and Interactive Arts; 10/2019, DOI:10.1145/3359852.3359893

Bruno Mendes da Silva, António Bandeira Araújo, Mirian Tavares: Cadavre Exquis: A Motion-Controlled Interactive Film. ARTECH 2019: 9th International Conference on Digital and Interactive Arts; 10/2019, DOI:10.1145/3359852.3359933

António Araújo, Lucas Fabián Olivero, Adriana Rossi: Boxing the Visual Sphere: towards a systematic solution of the cubical perspective. 41° Convegno Internazionale dei Docenti della Representazione Congresso della Unione Italiana per il Disegno; 09/2019

António Bandeira: A Fisheye Gyrograph: Taking Spherical Perspective for a Spin. Bridges 2019 - Mathematics, Art, Music, Architecture, Education, Culture, Linz, Austria; 07/2019

António Bandeira: Let's Sketch in 360°: Spherical Perspectives for Virtual Reality Panoramas. Bridges 2018 - Mathematics, Art, Music, Architecture, Education, Culture, Stockholm, Sweden; 01/2018

António Araújo: Cardboarding Mixed Reality with Dürer Machines. xCoAx 2017: Fifth Conference on Computation, Communication, Aesthetics and X., Lisbon, Portugal; 11/2017

António Araújo, Manuel Flores, Mauro Figueiredo: Anamorfoses e outras tecnologias imersivas no contexto da educação artística. II COLÓQUIO de Desafios Curriculares e Pedagógicos na Formação de Professores, Minho; 09/2017

António Araújo: Guidelines for Drawing Immersive Panoramas in Equirectangular Perspective. the 8th International Conference; 09/2017, DOI:10.1145/3106548.3106606

António Araújo: A geometria (descritiva) da anamorfose e das perspectivas curvilineas. Workshop de Matemática e Arte, Évora; 01/2017

António Araújo: Anamorphosis: optical games with perspective's playful parent. Recreational Mathematics Colloquium, 5, Lisbon; 01/2017

#### **Books**

António Araújo, Adérito Marcos, Pedro Alves da Veiga: *Proceedings of 1st International Conference on Transdisciplinary Studies in Arts, Technology and Society, ARTeFACTo 2018*. 01/2018; Artech International., ISBN: 978-989-99370-7-9

#### **Book Chapters**

Adérito Fernandes-Marcos, Amílcar Martins, Ângela Saldanha, António Araújo, Elizabeth Carvalho, José Bidarra, José Coelho, Paulo Shirley, Pedro Alves da Veiga, Vítor Cardoso, Carlos Castilho Pais: *Enhancement of Russian creative education: new post-graduation programme in digital art practice (Universidade Aberta, Portugal)*. Russian creative education in Digital Arts in line with EU standards, 01/2016: pages 26-42; University of Moscow., ISBN: 978-5-87627-142-6

**Manuals and Course Notes:**

Araújo, A., 2015. Anamorfoses e Perspectivas Curvilíneas.

Araújo, A., 2015. Inferência Bayesiana.

**Thesis:**

Classificação analítica de gemes de curvas Legendrianas – Master's thesis, 1999.

Legendrian Varieties and Quasi-Ordinary Hypersurfaces -Ph.D. Thesis. (2011)

**Publications (Artwork)****Book Illustration:**

"Letters from Portugal", Landeg White, illustrated by António Araújo, Kondwani Press, 2014.

"Out of the Office", José Gabriel Quaresma, Carlos Gonçalves, Vida Económica, 2013.

Conversas nº4, (34 illustrations + cover), abril 2013

**Illustration of Book covers:**

"Translating Camões", Landeg White, Universidade Católica, 2013

**Other illustration work:**

Illustration for advertisement of RDP2 radio show "ouvido de Maxwell". 2007.

Illustrations/projections for concert/multimedia play "Che Chosa è quest'Amor", teatro nacional D. Maria II, RDP2, 15 de May 2007.

Illustration for ideafixa #11, june 2008.

Lisboa by Urban Sketchers, Zest Books, Lisboa, 2015. (two illustrations)

**Illustrations for scientific articles:**

Illustration for "Dynamics of N-person snowdrift games in structured populations", J. Pacheco, F. C. Santos et al, Journal of theo. Biology, vol 315, 21 december 2012, pp. 81-86.

Illustration for "Climate policies under wealth inequality" J. Pacheco, F. C. Santos et al, Journal of theo. Biology, vol 315, 21 december 2012, pp. 81-86.

Illustration for Ph.D. thesis "Evolutionary Dynamics of Collective Action in Structured Populations" - Marta Daniela de Almeida Santos ( pg. 86 )

**Exhibitions** A. B. Araújo, Retratos desenhados, 13-30 abril 2013, biblioteca camões, Lisbon, Portugal

A. B. Araújo, Desenho no estúdio de dança, exposição da associação USk Portugal. Escola de dança do conservatório nacional, 29 abril-13 May 2016, Lisbon, Portugal

A. B. Araújo, Perspectivas e Anamorfoses, Galeria de Óbidos, 10-12 nov 2017, Óbidos, Portugal.

A. B. Araújo, Bruno Silva et al., Cadavre Exquis 1.0 (interactive film), Macau Literary Festival, 18-25 de March 2019, Macau, China.

A. B. Araújo, Bruno Silva et al., Cadavre Exquis Expanded, FICLO (Festival Internacional de Cinema e literatura de Olhão), 4-14 April 2019, Olhão, Portugal.

A. B. Araújo, Bruno Silva et al., Cadavre Exquis (v 3.0) (Kinect interactive film), Artech 2019, Fórum Altice, 23-25 oct. 2019, Braga, Portugal

A. B. Araújo, L. F. Olivero, S. Antinozzi, Himmaterial, Artech 2019, Fórum Altice, 23-25 oct. 2019, Braga, Portugal

A. B. Araújo & H. Ammann, Place, Galeria Humble Projets, 28 set - 6 out. 2019, Bangkok, Thailand

A. B. Araújo & H. Ammann, Place, Club Fareense, 3-9 out. 2019, Faro, Portugal

**Software authorship** A. B. Araújo, Eq A Sketch 360 (software for equirectangular drawing). 2019.

A. B. Araújo, Cadavre Exquis (software for interactive film). 2019.

**Workshop and Talks** "Moduli Spaces of Germs of Legendrian Curves", Geometria em Lisboa - IST, Lisboa, 17 Maio 2001

(with O. Neto) "Moduli of germs of irreducible Legendrian curves", em Applications of Singularity Theory to Geometry, Liverpool, Dezembro de 2000.

(with O. Neto) "Moduli of Legendrian curve singularities", em Singularities in Geometry and Analysis, convento de St. Marienthal, Alemanha, Setembro de 2002.

"Numerical Semigroups associated to algebraic curves", Iberian Meeting on Numerical Semigroups, Porto, 17-19 de Abril de 2008.

"A classificação analítica das curvas legendrianas", Universidade Aberta, Lisboa, Julho 2008

"Limits of Tangents of a Quasi-Ordinary Hypersurface", Iberian Meeting on Algebraic Analysis and Geometry, Lisboa, 28-30 Setembro 2011

Drawing on the whole brain: mathematics and the teaching of Art \* 4th International Workshop on Mathematical E-Learning - E-MATH 2012, Universidade Aberta, Lisbon, July 5-6, 2012

*Geometry and Art in online education*, E-math 2014, 6th International Workshop in Mathematical E-learning, Universitat Oberta de Catalunya (UOC), Barcelona, 24-25 Abril 2014

Cone projections and freehand deformations, E-math 2015, Porto, 8-9 June 2015.

Anamorfose e Cor na Geometria e na Arte, Escola de Verão da SPM, 2-5 de setembro de 2015.

Ruler, Compass and Nail: 360 degree Spherical Perspective made simple, X Workshop on Statistics, Mathematics and Computation (WSMC10) | V Portuguese-Polish Workshop on Biometry, 2016

Cardboarding Mixed Reality with Dürer Machines, 5th Conference on Computation, Communication, Aesthetics & X, Lisbon, 2017.

Optical Games: Anamorphosis and the Curious Perspectives  
RM17. Recreational Mathematics Colloquium v G4G (Europe), museu de historia natural, Lisboa, 28-31 Janeiro 2017

Araújo, A.B., Let's Sketch in 360°: Spherical Perspectives for Virtual Reality Panoramas. Bridges Stockholm, Mathematics, Art, Music, Architecture, Education, Culture, 25–29 July, Stockholm, Sweden.

A. B. Araújo, Os panoramas de Realidade Virtual na aprendizagem online das perspetivas curvilíneas, 10th International Workshop in Mathematics e-Learning (e-math 2018), October 15-16, Univ. Aberta, Lisbon, Portugal. <https://eventos.uab.pt/10emath2018/>

Araújo, A.B., 2019. A fisheye gyrograph, Bridges 2019: Mathematics, Art, Music, Architecture, Education, Culture.

#### Teaching experience in visual arts

#### Teaching experience in the visual arts:

Drawing workshops at instituto Tânia Estrada, Lisboa, 2007.

Collaboration with Prof. Cristina Branco (FBAUL) in teaching a class on Durer machines in sculpture at Faculty of Arts Univ. Lisbon, 2014.

Authorship and lecturing of module “Matemática e Arte – Pavimentações Escherianas” of the AEEP course, Univ. Aberta, 2011.

Authorship and lecturing of module of ALV course “Matemática e Arte”, Univ. Aberta, 2013, 2015.

Authorship and lecturing of module “Tópicos de Geometria e Cor na Representação Visual” for the Ph.D. in Digital Media Art (DMAD) of Universidade Aberta – 2017, 2018.

Authorship and lecturing of module “Geometry and Visual Immersion” for the Ph.D. in Digital Media Art (DMAD) of Universidade Aberta – 2019 onwards.

Workshop of spherical perspective drawing at *retiro DMAD*, UAb, 2018; *Desenhar Panoramas de Realidade Virtual à Mão Nua*. [https://ciac.pt/wp-content/uploads/2018/07/RetiroDMAD2018\\_livro\\_WEB.pdf](https://ciac.pt/wp-content/uploads/2018/07/RetiroDMAD2018_livro_WEB.pdf)

Workshop of spherical perspective drawing at Bridges Stockholm 2018: *Let's Sketch in 360°: spherical perspectives for VR panoramas.*

<http://bridgesmathart.org/bridges-2018/>

**Awards** Prémio Gulbenkian de Estímulo à Investigação - 2000

**Organization of Conferences** Junior School on Complex Dynamics, Lisboa, Portugal, Setembro de 1999

2as Jornadas de Matemática da UAb, Abril de 2013, univ. aberta, Lisboa, Portugal. Organizadores: Maria do Rosário Ramos, António Araújo.

“Matemática na Aberta”, Lisbon, Portugal, 2015.

1º Encontro Luso-Brasileiro TEAR - Territórios Artísticos com a Matemática, Óbidos, Portugal, 10-12 de november 2017

Artefacto 2018, 1st International Conference of Transdisciplinary Studies in Arts, Technology and Society, UAb, Lisboa, 16-17 novembro 2018. <http://artefacto.artech-international.org/>

**Certifications** Teaching certification A43 – Mathematics/Quantitative methods (reg. CCPFC/RFO-CCPFC/RFO-26326/09)