Hugo V. V. Braga

CONTACT INFORMATION

D.Sc. in Computer Science
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RESEARCH INTERESTS

Internet of Things and Combinatorial Optimization and Graph Theory.

EDUCATION

University of São Paulo, São Paulo, SP, Brazil

D.Sc., Computer Science, December 2018 **[O1]**

- Thesis Topic: *Exact algorithms for spanner problems in graphs (in Portuguese)*
- Superviser: Professor Yoshiko Wakabayshi
- Area of Study: Combinatorial Optimization and Graph Theory

Federal University of Bahia, Salvador, BA, Brazil

M.Sc., Mechatronics, October 2012 **[O2]**

- Thesis Topic: *Algorithms for the Directed k-Spanner with Minimum Degree Steiner Tree Problem*
- Superviser: Professor Flávio Assis
- Area of Study: Mechatronics, Algorithms and Graph Theory

PgCert, Distributed Systems, December 2009

- Final Project Topic: *Medium Accesss Control Protocols for Wireless Sensor Networks* (in Portuguese)
- Superviser: Professor Flávio Assis
- Area of Study: Medium Access Control, Algorithms

B.Sc., Computer Science, December 2008

- Final Project Topic: *Design and Implementation of a Monitoring Mechanism for a QoS Distributed Provider* (in Portuguese)
- Superviser: Professor Sérgio Gorender
- Area of Study: Quality of Service, Real-Time Systems

PUBLICATIONS

[P1] H. Braga. "Minimum Weight Tree Spanner Problem". *II Encontro de Teoria da Computação (ETC 2017) - XXXVII CSBC*. Sociedade Brasileira de Computação, 2017.

[P2] H. Braga and F. Assis. "A Topology Control Algorithm for Interference and Energy Efficiency in Wireless Sensor Networks". *Ad-hoc, Mobile, and Wireless Networks*. Ed. by H. Frey, X. Li, and S. Ruehrup. Vol. 6811. Lecture Notes in Computer Science. Springer Berlin Heidelberg, 2011, pp. 86–99. DOI: 10.1007/978-3-642-22450-8_7. URL: http://dx.doi.org/10.1007/978-3-642-22450-8_7.

OTHER PUBLICATIONS

[O1] H. Braga. "Algoritmos exatos para problemas de spanner em grafos". PhD thesis. University of São Paulo, 2018.

[O2] H. Braga. "Algorithms for the Directed k-Spanner with Minimum Degree Steiner Tree Problem". MA thesis. Federal University of Bahia, 2012.

[O3] H. Braga and R. Macêdo. "Design and Implementation of a Monitoring Mechanism for a QoS Distributed Provider". *IX Research and Graduate Seminar XXVII Student Research Seminar PRPPG*. in Portuguese. UFBA. Nov. 2008.

GRANTS

[G1] Graduate Fellowship, University of São Paulo, *Spanners in Graphs* (in portuguese), granted (#2013/22875-9) by The State of São Paulo Research Foundation (FAPESP) for the Ph.D. position, March, 2014 to February, 2018.

[G2] Graduate Fellowship, Federal University of Bahia, granted by Brazilian Federal Agency for the Improvement of Higher Education (Capes) for the Ph.D. position (ranked 1st in the Ph.D. selection), March, 2012 to April, 2013. Interrupted.

[G3] Graduate Fellowship, Federal University of Bahia, granted by Capes for the Master position, March, 2010 to February, 2012.

[G4] Undergraduate Fellowship, Federal University of Bahia, *Models for Fault-Tolerant Hibrid and Adaptative Distributed Systems* (in portuguese), granted by The State of Bahia Research Foundation (FAPESB) for the scientific initiation position, August, 2007 to July, 2008.

[G5] Undergraduate Scholarship, Federal University of Bahia, granted by Foundation for Support of Research and Extension (FAPEX), January, 2007 to May, 2007.

TEACHING EXPERIENCE

Federal University of Bahia, Salvador, BA, Brazil

Assistant Lecturer for MATA86: Computer Networks **August 2011 to December 2011**

- Graduate-level and Undergraduate-level course in algorithms for Wireless Sensor Networks

Federal Institute of Education, Science and Technology of Bahia (IFBa), Salvador, BA, Brazil

Guest Lecturer for Advanced Topics in Computer Science course **August 2011**

- Undergraduate-level course
- Lecture: "Topology control algorithms for Wireless Sensor Networks"

PROFESSIONAL EXPERIENCE

Amazonas Court of Justice (TJAM), Manaus, Brazil

Project Manager **December 2022 up to now**

- Project Contract Management.
- Streamlining Process Flow.
- Overseeing Software Factory Projects.
- Managing Remote Teams.
- Leading Internal Project Development.

Analyst - Software Engineer **August 2020 up to now**

- Ranked 2º in the public service entrance exam for Analyst position - Speciality: Software Engineer.
- Member of Secretariat of Information and Communication Tecnology (SETIC).

University of São Paulo, São Paulo, SP, Brazil
Institute of Mathematics and Statistics
Computer Science Department
Combinatorics and Combinatorial Optimization Research Group

Graduate Researcher **[P1, O1]** **August 2013 to December 2018**

- Funding: **[G1]**
- Supervisor: Professor Yoshiko Wakabayashi
- Research: Combinatorial Optimization and Graph Theory.

- Proposal of the first two ILP formulations for the *Minimal Weight Tree t-Spanner Problem*.
- Proposal of an ILP formulation for the *Minimal Weight t-Spanner Problem* (MWSP).
- Presentment of some computational results on the implementation of a branch and price algorithm for MWSP based on an ILP formulation proposed by Sigurd and Zachariasen (2004).

Federal University of Bahia, Salvador, BA, Brazil
Computer Science Department
Distributed Systems Laboratory (LaSiD)

Graduate Researcher **[P2, O2]** **March 2010 to April 2013**

- Funding: **[G2, G3]**
- Supervisor: Professor Flávio Assis
- Description of a localized topology control algorithm which is very efficient in terms of interference while minimizing energy efficiency.
- Development of a new interference metric for Wireless Sensor Networks and evaluation of some topology control algorithms based on this metric.
- Proposal of a new problem in graph theory literature to address the spanner property and degree minization called *Directed k-Spanner with Minimum Degree Steiner Tree Problem* (DSMDStP).
- Development of an approximation algorithm and a heuristic for DSMDStP problem.

Undergraduate Researcher **[O3]** **August 2007 to July 2008**

- Funding: **[G4]**
- Supervisor: Professor Sérgio Gorender
- Designed and implemented a monitoring mechanism for a QoS Distributed Provider using C language and SNMP protocol, and the mechanism was applied in Xenomai Real-Time Operating System and the Expedited Services of Cisco routers.

Data Processing Company of the State of Bahia (Prodeb), Salvador, Brazil

Software Engineer **February 2009 to February 2010**

- Development web services using PHP language.
- Co-development a calendar system using PHP language along with Postgres DB and script languages.
- Wrote (English) tutorials for the open source community as well as documentation for the developed systems.

Federal University of Bahia, Salvador, BA, Brazil
Polytechnic school
Geotechnical Laboratory

Programmer **January 2007 to May 2007**

- Funding: **[G5]**
- Maintenance and development of a system in DELPHI for sample management and calculation of soil tests called LabGeo.
- Support the development of a web system for a weather station using PHP and MySQL languages.

Professional Memberships

- Brazilian Network of Smart and Human Cities - RBCIH (05/2020–today)
- The Internet of Things Brazilian Association - IoT Connection (04/2020–today)
- Combinatorics and Combinatorial Optimization Research Group (08/2013–12/2018)
- Distributed Systems Laboratory (LaSiD) (08/2007–12/2008; 03/2010–06/2013)
- Brazilian Computer Society (SBC) (2007–2009)

Other Meeting Attendance

- Sebrae - Startup Day, May 22, 2021
- IoT 2020 Brasil Summit, June 03, 2020
- II Meeting of Theory of Computing (XXXVII CSBC), July 03–04, 2017
- I Paulista Workshop on Optimization, Combinatorics and Algorithms, June 16–18, 2017
- NICTA 3rd International Optimisation Summer School, January 11–16, 2015
- Workshop in Bioinformatics and Algorithms, March 25–26, 2014
- 26th International Symposium on Distributed Computing, October 16–18, 2012
- 10th International Free Software Forum, June 24–27, 2009
- VIII Computer Regional School of Bahia, Alagoas and Sergipe (ERBASE), April 14–18, 2008
- IX Research and Graduate Seminar – XXVII Student Research Seminar/PRPPG – UFBA, Salvador, Brazil, November 12–14, 2008
- GTER 20 and GTS 11 joint meetings, May 31–June 1, 2008
- XI Internal Workshop of LaSiD – Wola, November 27, 2007
- XXII National Meeting of Computer Science Students, 2004

Skills

Languages

- Portuguese (Native)
- English (advanced speaking and writing skills - TOEFL iBT: 101, taken on December 2012)
- Basic French

Program/Script Languages

- C/C++, Java, Python, Shell Script, PHP

Scientific Softwares

- ILP Solver: CPLEX
- Simulator/Emulator: The ONE, Omnet++, Castalia, SMPL
- Real-Time: Xenomai, Diffserv (Cisco Routers)
- Others: SNMP, Lemon (c++)

References Available to Contact

Prof. (Dr.-Ing) Flávio Assis (e-mail: fassis@ufba.br)

- Associate Professor, Departament of Computer Science, Federal University of Bahia
  - ⋆ *Dr. Assis was my MSc. thesis supervisor.*

Prof. (Dr. rer. nat.) Yoshiko Wakabayashi (e-mail: yw@ime.usp.br)

- Full Professor, Department of Computer Science, University of São Paulo
  - ⋆ *Dr. Wakabayashi was my PhD. thesis supervisor.*

Prof. (PhD.) Raimundo J. A. Macêdo (e-mail: macedo@ufba.br)

- Full Professor, Departament of Computer Science, Federal University of Bahia
  - ⋆ *Dr. Macêdo is the head of LaSiD.*

Prof. (Dr.) Sérgio Gorender (e-mail: gorender@ufba.br)

- Associate Professor, Departament of Computer Science, Federal University of Bahia
  - ⋆ *Dr. Gorender was my B.Sc. supervisor. I did my Scientific Initiation under his supervisor.*

More Information

More information and auxiliary documents can be found at http://hugobraga.io.