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Academic Background

Ph.D. in Information Systems and Computer Engineering, Technical University of Lisbon, 2012.

Thesis: *Topology Management for Unstructured Overlay Networks*.

Advisor: Professor Luís Rodrigues.

Final Mark: Pass with Distinction.

M.Sc. in Computer Science and Engineering, University of Lisbon, 2007.

Thesis: *Gossip-based Broadcast Protocols*.

Advisor: Professor Luís Rodrigues.

Final Mark: 20 (out of 20).

B.Sc. in Computer Science and Engineering, University of Lisbon, 2006.

Final Mark: 16 (out of 20).

Current Position

Assistant Professor at the Departamento de Informática, Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa, Caparica, Portugal.

October 2016 – present.

Integrated Member at the NOVA Laboratory for Computer Science and Informatics (NOVA LINCS).

October 2016 – present.

Past Positions

Invited Assistant Professor at the Departamento de Informática, Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa, Caparica, Portugal.

September 2015–October 2016.

Postdoctoral Researcher and Integrated Member at the NOVA Laboratory for Computer Science and Informatics (NOVA LINCS)¹, Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa, Caparica, Portugal.

January 2013–October 2016.

Postdoctoral Fellow, Distributed Systems Group, INESC-ID Lisboa, September 2012–December 2012.

Junior Researcher, Distributed Systems Group, INESC-ID Lisboa, August 2007–September 2012.

Junior Researcher, DIALNP Research Group, at the Lasige Laboratory, University of Lisbon, August 2006–August 2007.

Software Developer, at CIISEG, Technical University of Lisbon, November 2001–August 2006.

¹ Formerly CITI Laboratory

Research Interests

Research Statement:

Systems are becoming more and more relevant to the everyday life of a broader number of users. This leads system's design and architectures to become more and more complex at the same time that user's expectations concerning responsiveness, availability, and dependability grow. In this context, my research strives to answer the broad question of: *How to scale systems, and distributed systems in particular, in number of components, geographic distribution, and user base, while ensuring high availability, efficiency, and fault tolerance?* To answer this question I focus on the following research vectors: *i)* devising new algorithms and solutions to scale distributed architectures, such as those of distributed databases, both within the scope of a data center, as well as across multiple geo-distributed sites, minimizing the use of centralized components that hinder performance and fault tolerance; *ii)* understanding fundamental aspects of consistency semantics in the context of data replication and proposing new algorithms that explore relevant trade-offs between consistency and user perceived performance; *iii)* extending the horizon of replication techniques, in the context of geo-replicated data stores, as to include clients, while enabling direct browser-to-browser communication and collaboration, in an intuitive way for system architects; and *iv)* devise new security mechanisms to increase the dependability of cloud-based large-scale systems.

Relevant Keywords:

Large-Scale Distributed Systems.
 Fault Tolerance and Dependability.
 Peer-to-Peer Systems.
 Cloud Computing.
 Edge Computing.
 Geo-Replicated Data Stores.
 Consistency in Replicated Systems.
 Security.

Research

Google Scholar Profile: <http://scholar.google.com/citations?user=j1676F4AAAAJ>

Journal Publications

2017

Practical Privacy-Preserving Content-Based Retrieval in Cloud Image Repositories.
 B. Ferreira, J. Rodrigues, **J. Leitão**, and H. Domingos.
 IEEE Transactions on Cloud Computing, 2017.

2016

Geo-Replication: Fast If Possible, Consistent If Necessary.
 V. Balegas, C. Li, M. Najafzadeh, D. Porto, A. Clement, S. Duarte, C. Ferreira, J. Gehrke, **J. Leitão**, N. Preguiça, R. Rodrigues, M. Shapiro, and V. Vafeiadis.
 Bulletin of the Technical Committee on Data Engineering. IEEE Computer Society. March 2016.

2012

A-OSGi: a framework to support the construction of autonomic OSGi-based applications.
 João Ferreira, **João Leitão** and Luís Rodrigues.
 International Journal on Autonomous and Adaptive Communications Systems, Vol. 5, No. 3, pp. 292-310, 2012.

X-BOT: A Protocol for Resilient Optimization of Unstructured Overlay Networks.

João Leitão, João P. Marques, José Pereira, and Luís Rodrigues.

IEEE Transactions on Parallel and Distributed Systems (Published online January 2012).

Book Chapters

2018

Programming Models and Runtimes

G. Da Costa, A. L. Lastovetsky, J. G. Barbosa, J. C. Diaz-Martin, J. L. Garcia-Zapata, M. Janetschek, E. Jeannot,

J. Leitão, R. R. Manumachhuh, R. Prodan, J. A. Rico-Gallego, P. van Roy, A. Shoker, and A. van der Linde

The IET. Book chapter (Chapter 2). Ultrascale Computing Systems. 2018.

Achieving Low Latency Transactions for Geo-replicated Storage with Blotter.

H. Moniz, **J. Leitão**, R. J. Dias, J. Gehrke, N. Preguiça, and R. Rodrigues.

Sakr S., Zomaya A. (eds) Encyclopedia of Big Data Technologies. Springer, Cham pp. 1-10. 2018.

2010

Gossip-Based Broadcast.

João Leitão, José Pereira and Luís Rodrigues.

In Handbook of Peer-to-Peer Networking, X. Shen, H. Yu, J. Buford, M. Akon (Eds.), Springer 2010.

ISBN: 978-0-387-09750-3

On Adding Structure to Unstructured Overlay Networks.

João Leitão, Nuno Carvalho, José Pereira, Rui Oliveira, and Luís Rodrigues.

In Handbook of Peer-to-Peer Networking, X. Shen, H. Yu, J. Buford, M. Akon (Eds.), Springer 2010.

ISBN: 978-0-387-09750-3

Conference and Workshop Publications

2019

Time-Aware Reactive Storage in Wireless Edge Environments.

J. Silva, H. Paulino, J. M. Lourenço, **J. Leitão**, and N. Preguiça.

Proceedings of the 16th EAI International Conference on Mobile and Ubiquitous Systems: Computing, Networking and Services (MobiQuitous), Houston, USA, November 12-14, 2019 (to appear).

Microservices Management on Cloud/Edge Environments.

A. Carrusca, M. Cecília Gomes, and **J. Leitão**.

Proceedings of the 4th Workshop on Adaptive Service-Oriented and Cloud Applications (ASOCA) colocated with ICSOC. Toulouse, France, October 2019.

Revisiting Broadcast Algorithms for Wireless Edge Networks.

A. Rosa, P. A. Costa, and **J. Leitão**.

Proceedings of the 38th IEEE International Symposium on Reliable Distributed Systems (SRDS 2019), Lyon, France, October 2019.

BISEN: Efficient Boolean Searchable Symmetric Encryption with Verifiability and Minimal Leakage.

B. Ferreira, B. Portela, T. Oliveira, G. Borges, H. Domingos, and **J. Leitão**.

Proceedings of the 38th IEEE International Symposium on Reliable Distributed Systems (SRDS 2019), Lyon, France, October 2019.

Enabling Fog Computing using Self-Organizing Compute Nodes.

V. Karagiannis, S. Schulte, **J. Leitão**, and N. Preguiça.

Proceedings of the 3rd IEEE International Conference on Fog and Edge Computing (ICFEC 2019).

Data Replication on the Cloud/Edge.

D. Mealha, N. Preguiça, M. Cecília Gomes, and **J. Leitão**.

Proceedings of the 6th Workshop on Principles and Practice of Consistency (PaPoC 2019), 25 March, Dresden, Germany, 2019.

Efficient Synchronization of State-based CRDTs.

V. Enes, P. S. Almeida, C. Baquero, and **J. Leitão**.

Proceedings of the 35th IEEE International Conference on Data Engineering (ICDE 2019). 8-12 April, 2019. Macau, China.

2018

Practical and Fast Causal Consistent Partial Geo-Replication.

P. Fouto, **J. Leitão**, and N. Preguiça.

Proceedings of the 17th IEEE International Symposium on Network Computing and Applications (NCA 2018). November 1-3, 2018. Cambridge, USA.

Practical Continuous Aggregation in Wireless Edge Environments.

P. Costa and **J. Leitão**.

Proceedings of the 37th IEEE International Symposium on Reliable Distributed Systems (SRDS 2018), October 2-5, 2018.

MuSE: Multimodal Searchable Encryption for Cloud Applications.

B. Ferreira, **J. Leitão**, and H. Domingos.

Proceedings of the 37th IEEE International Symposium on Reliable Distributed Systems (SRDS 2018), October 2-5, 2018.

The Tortoise and the Hare: Characterizing Synchrony in Distributed Environments (Practical Experience Report).

D. Porto, **J. Leitão**, F. Junqueira, and R. Rodrigues.

Proceedings of the 48th International Conference on Dependable Systems and Networks (DSN 2018), 25-28 June, 2018, Luxembourg.

2017

Fine-Grained Consistency Upgrades for Online Services.

F. Freitas, **J. Leitão**, N. Preguiça, and R. Rodrigues.

Proceedings of the IEEE 36th Symposium on Reliable Distributed Systems (SRDS 2017), 26-29 September, 2017. Hong Kong, China.

FMKe: a Real-World Benchmark for Key-Value Data Stores.

G. Tomás, P. Zeller, V. Balesgas, D. Akkoorath, A. Bieniusa, **J. Leitão**, and N. Preguiça.

Proceedings of the Workshop on Principles and Practice of Consistency for Distributed Data (PAPOC'17) April 23, 2017. Belgrade, Serbia.

Borrowing an identity for a Distributed Counter (Work in Progress Report).

V. E. Duarte, C. Baquero, P. S. Almeida, and **J. Leitão**.

Proceedings of the Workshop on Principles and Practice of Consistency for Distributed Data (PAPOC'17) April 23, 2017. Belgrade, Serbia.

Multimodal Indexable Encryption for Mobile Cloud-based Applications. B. Ferreira, **J. Leitão**, and H. Domingos.

Proceedings of the 47th IEEE/IFIP International Conference on Dependable Systems and Networks (DSN'17), Denver, USA, June, 2017.

Legion: Enriching Internet Services with Peer-to-Peer Interactions.

A. Linde, P. Fouto, **J. Leitão**, N. Preguiça, S. Castiñeira, and A. Bieniusa.

Proceedings of the 26th International Conference on World Wide Web (WWW'17), Perth, Western Australia, April, 2017.

Blotter: Low Latency Transactions for Geo-Replicated Storage.

H. Moniz, **J. Leitão**, R. Dias, J. Gehrke, N. Preguiça, and R. Rodrigues.

Proceedings of the 26th International Conference on World Wide Web (WWW'17), Perth, Western Australia, April, 2017.

2016

Towards the Opportunistic Combination of Mobile Ad-hoc Networks with Infrastructure Access.

J. Silva, **J. Leitão**, N. Preguiça, Joo M. Lourenço, and Hervé Paulino. Proceedings of the 1st Workshop on Middleware for Edge Clouds & Cloudlets (MECC'16), Trento, Italy, December 2016.

Δ -CRDTs: Making δ -CRDTs Delta-Based.

Albert van der Linde, **João Leitão**, and Nuno Preguiça.

Proceedings of the Workshop on Principles and Practice of Consistency for Distributed Data (PaPoC 2016), London, UK, April 2016.

Characterizing the Consistency of Online Services (Experience Report).

Filipe Freitas, **João Leitão**, Nuno Preguiça, and Rodrigo Rodrigues.

Proceedings of the 46th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN 2016), Toulouse, France, June 2016.

2015

Privacy-Preserving Content-Based Image Retrieval in the Cloud.

Bernardo Ferreira, João Rodrigues, **João Leitão**, and Henrique Domingos.

Proceedings of the 34th IEEE Symposium on Reliable Distributed Systems (SRDS 2015), Montreal, Quebec, Canada, September 2015.

Visigoth Fault Tolerance.

Daniel Porto, **João Leitão**, Cheng Li, Allen Clement, Aniket Kate, Flávio Junqueira, and Rodrigo Rodrigues.

Proceedings of the EuroSys Conference, Bordeaux, France, April 2015.

Minimizing coordination in replicated systems.

Cheng Li, **João Leitão**, Allen Clement, Nuno Preguiça, and Rodrigo Rodrigues.

Proceedings of the First Workshop on Principles and Practice of Consistency for Distributed Data (PaPoC'15), collocated with Eurosys'15, Bordeaux, France, April 2015.

2014

Towards an Image Encryption Scheme with Content-Based Image Retrieval Properties. (short paper)

Bernardo Ferreira, João Rodrigues, **João Leitão**, and Henrique Domingos.

Proceedings of the 9th International Workshop on Data Privacy Management (DPM 2014), collocated with the European Symposium on Research in Computer Security (ESORICS 2014), Wroclaw, Poland, September 2014, Springer Verlag (LNCS).

Overnesia: a Resilient Overlay Network for Virtual Super-Peers.

João Leitão and Luís Rodrigues.

Proceedings of the 33 IEEE Symposium on Reliable Distributed Systems (SRDS 2014), Nara, Japan, October 2014.

Automating the Choices of Consistency Levels in Replicated Systems.

Cheng Li, **João Leitão**, Allen Clement, Nuno Preguia, Rodrigo Rodrigues, and Viktor Vafeiadis.

Proceedings of the USENIX Annual Technical Conference (USENIX ATC 2014), Philadelphia, PA, USA, June 2014.

2013

Rollerchain: a DHT for Efficient Replication (Best Student Paper Award).

João G. Paiva, **João Leitão**, and Luís Rodrigues.

Proceedings of the 12th IEEE International Symposium on Network Computing and Applications (IEEE NCA13), Cambridge, MA USA, August 2013.

ChainReaction: a Causal+ Consistent Datastore based on Chain Replication.

Sérgio Almeida, **João Leitão**, Luís Rodrigues.

Proceedings of the EuroSys Conference, Prague, 2013.

Bounded Gossip: A Gossip Protocol for Large-Scale Datacenters.

Miguel Branco, **João Leitão**, and Luís Rodrigues.

Proceedings of the 28th Symposium On Applied Computing (SAC), Coimbra, Portugal March 18-22, 2012.

2012

MobUser: publish-subscribe communication for mobile nodes.

Mauro Silva, **João Leitão**, and Carlos Ribeiro.

Proceedings of the 18th IEEE International Conference on Parallel and Distributed Systems (ICPADS), Singapore, December 2012.

2011

N-party BAR Transfer.

Xavier Vilça, **João Leitão**, Miguel Correia, and Luís Rodrigues.

Proceedings of the 15th International Conference On Principles Of Distributed Systems (OPODIS), Toulouse, France, December 2011.

N-party BAR Transfer: Motivation, Definition, and Challenges.

Xavier Vilça, **João Leitão**, and Luís Rodrigues.

Proceedings of the 3rd Workshop on Theoretical Aspects of Dynamic Distributed Systems (TADDS), Rome, Italy, 20-22 September 2011.

2010

Thicket: A Protocol for Building and Maintaining Multiple Trees in a P2P Overlay.

Mário Ferreira, **João Leitão**, and Luís Rodrigues.

Proceedings of the 29th IEEE Symposium on Reliable Distributed Systems (SRDS), New Delhi, India, 31 October-3 November 2010.

Flexible and Efficient Resource Location in Large-Scale Systems.

João Alveirinho, João G. Paiva, **João Leitão**, and Luís Rodrigues.

Proceedings of the 4th ACM SIGOPS/SIGACT International Workshop on Large-Scale Distributed Systems and Middleware (LADIS), Zurich, Switzerland, 28-29 July 2010.

Observable Non-Sybil Quorums Construction in One-Hop Wireless Ad Hoc Networks.

Diogo Mónica, **João Leitão**, Luís Rodrigues, and Carlos Ribeiro.

Proceedings of the 40th Annual IEEE/IFIP International Conference on Dependable Systems and Networks, Chicago, Illinois, USA, June, 2010.

Mobile Users are not Static Users on the Move.

João Garcia, **João Leitão**, and Paulo Ferreira.

Proceedings of the 28th Brazilian Symposium on Computer Networks and Distributed Systems (SBRC), Gramado, Brazil, May, 2010.

Balancing Gossip Exchanges in Networks with Firewalls.

João Leitão, Robbert van Renesse, and Luís Rodrigues.

Proceedings of the 9th International Workshop on Peer-to-Peer Systems (IPTPS '10), San Jose, CA, USA, 27 April, 2010.

RASM: A Reliable Algorithm for Scalable Multicast.

Mouna Allani, **João Leitão**, Benoit Garbinato and Luís Rodrigues.

Proceedings of the 18th Euromicro International Conference on Parallel, Distributed and Network-Based Computing (PDP), Italy, Pisa, Feb, 2010.

2009

A-OSGi: A framework to support the construction of autonomic OSGi-based applications.

João Ferreira, **João Leitão** and Luís Rodrigues.

Proceedings of the Third International ICST Conference on Autonomic Computing and Communication Systems, Limassol, Cyprus, Sep, 2009.

X-BOT: A Protocol for Resilient Optimization of Unstructured Overlays.

João Leitão, João P. Marques, José Pereira and Luís Rodrigues.

Proceedings of the 28th IEEE International Symposium on Reliable Distributed Systems, Niagara Falls, New York, U.S.A., Sep, 2009.

On the Use of Radio Resource Tests in Wireless ad hoc Networks.

Diogo Mónica, **João Leitão**, Luís Rodrigues, and Carlos Ribeiro.

Proceedings of the 3rd Workshop on Recent Advances on Intrusion-Tolerant Systems (WRAITS), Estoril, Portugal, Jun, 2009.

2008

Large-Scale Peer-to-Peer Autonomic Monitoring.

João Leitão, Liliana Rosa and Luís Rodrigues.

Proceedings of the Distributed Autonomous Network Management Systems Workshop (DANMS), New Orleans, USA, Oct, 2008.

2007

*Epidemic Broadcast Trees.*²

João Leitão, José Pereira and Luís Rodrigues.

Proceedings of the 26th IEEE International Symposium on Reliable Distributed Systems, Beijing, China, October, 2007.

HyParView: a membership protocol for reliable gossip-based broadcast.

João Leitão, José Pereira and Luís Rodrigues.

Proceedings of the 37th Annual IEEE/IFIP International Conference on Dependable Systems and Networks, Edinburgh, UK, June, 2007.

Other Publications

Towards Enabling Novel Edge-Enabled Applications.

João Leitão, Pedro Ákos Costa, Maria Cecília Gomes, and Nuno Preguiça. Technical Report. May 2018 (Available in arXiv).

Lower Bound and Correctness Proofs for Consensus in the Visigoth Model

(Companion Technical Report to the Visigoth Fault Tolerance (EuroSys'15))

Daniel Porto, **João Leitão**, Cheng Li, Allen Clement, Aniket Kate, Flavio Junqueira, and Rodrigo Rodrigues. NOVA University of Lisbon/NOVA LINC Technical Reports. TR-201501NOVALINCS01. April 2015.

Towards a Consistent Understanding of Consistency Levels. (Talk Only)

Henrique Moniz, Ricardo Dias, **João Leitão**, Lorenzo Alvisi, Allen Clement, and Rodrigo Rodrigues.

In 8th Workshop on Large-Scale Distributed Systems and Middleware (LADIS '14), October 23-24 in Cambridge, UK, 2014.

LLC-GNUMAP: Scalable, Precise, and High-Coverage Genomics Mapping. (Extended Abstract and Talk)

Natacha P. Leitão, **João Leitão**, and Francisco Couto.

In Bioinformatics Open Days, Universidade do Minho Braga, Portugal, February, 2014.

²The Plumtree protocol introduced in this paper was later integrated in the RIAC core. See more here: <http://www.youtube.com/watch?v=s4cCUTPU8GI>

Topology Management for Unstructured Overlay Networks.

João Leitão.

Ph.D.'s Thesis, Technical University of Lisbon, Sep, 2012.

Rollerchain: a DHT for High Availability (Poster).

João Paiva, **João Leitão**, and Luís Rodrigues.

Proceedings of the Workshop on Posters and Demos Track (PDT '11) of Middleware, Lisbon, Portugal, December, 2011.

Overnesia: a resilient overlay network for virtual super-peers (Technical Report).

João Leitão, Luís Rodrigues.

INESC-ID, Technical Report 56, 2008.

On the Structure of Unstructured Overlay Networks (Fast Abstract).

João Leitão, José Pereira and Luís Rodrigues.

In Supplement of the 38th Annual IEEE/IFIP International Conference on Dependable Systems and Networks, Anchorage, Alaska, USA, June, 2008.

Gossip-based Broadcast Protocols.

João Leitão.

Master's Thesis, University of Lisbon, May, 2007.

Publications in Portuguese

Agregação Contínua e Prática em Ambientes Sem Fios na Berma.

Pedro Ákos Costa and **João Leitão**.

Actas do décimo Simpósio de Informática, Coimbra, Portugal, Sep 2018.

Yggdrasil: Uma Framework para Desenvolvimento e Execução de Protocolos em Redes Ad Hoc.

Pedro Ákos Costa and **João Leitão**.

Actas do décimo Simpósio de Informática, Coimbra, Portugal, Sep 2018.

Consistência Causal em Sistemas Geo-Distribuídos com Replicação Parcial.

Pedro Fouto, **João Leitão**, and Nuno Preguiça.

Actas do décimo Simpósio de Informática, Coimbra, Portugal, Sep 2018.

Pesquisa Booleana Cifrada usando Hardware Confiável.

Guilherme Borges, **João Leitão**, Henrique Domingos and Bernardo Ferreira

Actas do décimo Simpósio de Informática, Coimbra, Portugal, Sep 2018.

Controlo de Acessos em Sistemas com Consistência Eventual.

Tiago Costa, Albert Linde, Nuno Preguiça and **João Leitão**.

Actas do oitavo Simpósio de Informática, Lisboa, Portugal, Sep 2016.

Aether: Uma solução híbrida para a pesquisa e partilha de conteúdos em redes móveis.

André Sampaio, Nuno Preguiça and **João Leitão**.

Actas do oitavo Simpósio de Informática, Lisboa, Portugal, Sep 2016.

Cifra Multimodal Indexável para Aplicações Móveis baseadas na Nuvem.

Bernardo Ferreira, **João Leitão** and Henrique Domingos.

Actas do Sétimo Simpósio de Informática, Covilhã, Portugal, Sep, 2015.

Enriquecimento de plataformas web colaborativas com comunicação browser-a-browser.

Albert van der Linde, **João Leitão** and Nuno Preguiça.

Actas do Sétimo Simpósio de Informática, Covilhã, Portugal, Sep, 2015.

DocNuvem: Edição Colaborativa de Documentos na Nuvem com Garantias de Privacidade.

João Rodrigues, Bernardo Ferreira, **João Leitão**, and Henrique Domingos.

Actas do Sexto Simpósio de Informática, Porto, Portugal, Sep, 2014.

Avaliação das Garantias de Consistência em Serviços Geo-Replicados.

João Costa, **João Leitão**, Daniel Porto, Nuno Preguiça, and Rodrigo Rodrigues.

Actas do Quinto Simpósio de Informática, Évora, Portugal, Sep, 2013.

MobUser: Uma plataforma para partilha de informação centrada no utilizador para dispositivos móveis (Short paper).

Mauro Silva, **João Leitão**, and Carlos Ribeiro.

Actas do Quarto Simpósio de Informática, Caparica, Portugal, Sep, 2012.

PEC: Protocolo Epidémico para Centros de dados.

Miguel Branco, **João Leitão**, and Luís Rodrigues.

Actas do Quarto Simpósio de Informática, Caparica, Portugal, Sep, 2012.

ChainReaction: uma Variante de Replicação em Cadeia com Coerência Causal+.

Sérgio Almeida, **João Leitão**, and Luís Rodrigues.

Actas do Quarto Simpósio de Informática, Caparica, Portugal, Sep, 2012.

Transferência de Dados entre Grupos de Processos no Modelo BAR (Best Paper Award).

Xavier Vilaa, **João Leitão**, and Luís Rodrigues.

Actas do Terceiro Simpósio de Informática, Coimbra, Portugal, Sep, 2011.

Thicket: Construção e Manutenção de Múltiplas Árvores numa Rede entre Pares.

Mário Ferreira, **João Leitão**, and Luís Rodrigues.

Actas do Segundo Simpósio de Informática, Minho, Portugal, Sep, 2010.

Curiata: Uma arquitetura P2P auto-organizável para uma localização flexível e eficiente de recursos.

João Alveirinho, **João Leitão**, João Paiva, and Luís Rodrigues.

Actas do Segundo Simpósio de Informática, Minho, Portugal, Sep, 2010.

Construção Observável de um Sistema de Quorum Não Sybil na Vizinhança Rádio de uma Rede Ad-Hoc Sem Fios.

Diogo Mónica, **João Leitão**, Luís Rodrigues, and Carlos Ribeiro.

Actas do Primeiro Simpósio de Informática, Lisboa, Portugal, Sep, 2009.

Aplicação da informática na criação de um dicionário. Case Study: Lexicon.

João Leitão.

Actas do Colóquio Internacional: LEXICON - Dicionário de Grego Português, Lisboa, Portugal, 2008.

Teaching

NOVA University of Lisbon

Teaching Activities:

2019 Fall

- Algoritmos e Sistemas Distribuídos (Algorithms and Distributed Systems).
Course Regent.
2 hours lectures, 4 hours laboratory classes (per week).

- Sistemas Transacionais (Transactional Systems).
Ph.D. Course, 2 hours per week (with Nuno Preguiça, João Lourenço, Henrique Domingos and Hervé Paulino).

2019 Spring:

- Sistemas Distribuídos (Distributed Systems).
Laboratory classes, 6 hours per week.
- Atividade Prática de Desenvolvimento Curricular - Project (Engineering Project).
Lectures and Support to students.

2018 Fall:

- Algoritmos e Sistemas Distribuídos (Algorithms and Distributed Systems).
Course Regent.
2 hours lectures, 4 hours laboratory classes (per week).
- Fundamentos de Sistemas de Operação (Introduction to Operating Systems).
Laboratory classes, 2 hours per week.

- Sistemas Transacionais (Transactional Systems).
Ph.D. Course, 2 hours per week (with Nuno Preguiça, João Lourenço, Henrique Domingos and Hervé Paulino).

2018 Spring:

- Sistemas Distribuídos (Distributed Systems).
Laboratory classes, 4 hours per week.
- Atividade Prática de Desenvolvimento Curricular - Project (Engineering Project).
Lectures and Support to students.

2017 Fall:

- Algoritmos e Sistemas Distribuídos (Algorithms and Distributed Systems).
Course Regent.
2 hours lectures, 4 hours laboratory classes (per week).
- Conceção e Implementação de Aplicações para a Internet (Design and Implementation of Internet Applications).
Laboratory classes, 4 hours per week.
- Sistemas Transacionais (Transactional Systems).
Ph.D. Course, 2 hours per week (with Nuno Preguiça and João Lourenço).

2017 Spring:

- Sistemas Distribuídos (Distributed Systems).
Laboratory classes, 6 hours per week.
- Atividade Prática de Desenvolvimento Curricular - Project (Engineering Project).
Lectures and Support to students.

2016 Fall:

- Fundamentos de Sistemas de Operação (Introduction to Operating Systems).
Laboratory classes, 2 hours per week.
- Sistemas Transacionais (Transactional Systems).
Ph.D. Course, 2 hours per week (with Nuno Preguiça and João Lourenço).

2016 Spring:

- Sistemas Distribuídos (Distributed Systems).
Laboratory classes, 4 hours per week.

2015 Fall:

- Redes de Computadores (Computer Networks).
Laboratory classes, 2 hours per week.
- Sistemas Transacionais (Transactional Systems).
Ph.D. Course, 2 hours per week (with Nuno Preguiça and João Lourenço).

2015 Spring:

- Programação Orientada pelos Objectos (Object Oriented Programming).
Laboratory classes, 2 hours per week.

Invited Lectures

- **A (not so) brief introduction to Gossip** in the course *Tecnologias de Middleware*, at FCUL, 2015.
- **Storage in the Cloud** in the course *Tecnologias de Middleware*, at FCUL, 2013.
- **A (not so) brief introduction to Gossip** in the course *Tecnologias de Middleware*, at FCUL, 2013.
- **Filiação para Protocolos Epidémicos** in the course *Tolerância a Falhas Distribuída*, at FCUL, 2006.

Oral Presentations*Conferences and Workshops*

Blotter: Low Latency Transactions for Geo-Replicated Storage at the 26th International Conference on World Wide Web (WWW'17), Perth, Western Australia, April, 2017.

When Weak Consistency is not Enough: From Causality to Transactions at the RICON 2015, San Francisco, United States of America, November 2015.

ChainReaction: a Causal+ Consistent Datastore based on Chain Replication at the Eurosys 2013, Prague, Czech Republic, 14 April, 2013.

MobUser: Uma plataforma para partilha de informação centrada no utilizador para dispositivos móveis at the 4th Portuguese Symposium on Informatics, Universidade Nova de Lisboa, Portugal, 7 September, 2012.

Balancing Gossip Exchanges in Networks with Firewalls at the 9th International Workshop on Peer-to-Peer Systems (IPTPS'10), San Jose, CA, USA, 27 April, 2010.

X-BOT: A Protocol for Resilient Optimization of Unstructured Overlays, at the 28th IEEE International Symposium on Reliable Distributed Systems (SRDS'10), Niagara Falls, New York, U.S.A., Sep, 2009.

Topology Aware Gossip Overlays, at the COST 295 Dynamo, Discussion Workshop and MC Meeting, February 18-20 2008, University of Freiburg, Freiburg, Germany

Epidemic Broadcast Trees, at the 26th IEEE International Symposium on Reliable Distributed Systems (SRDS07), Beijing, CHINA, October 12, 2007

HyParView: A Membership Protocol for Reliable Gossip-Based Broadcast, at the 37th Annual IEEE/IFIP international Conference on Dependable Systems and Networks (DSN07), Edinbourg, UK, June 28, 2007.

HyParView: a membership protocol for reliable gossip-based broadcast, at the COST 295 1st Workshop on Dynamic Networks, May 7-8 2007, Università degli Studi di Salerno, Salerno, Italy

Invited Talks

Gossiping from Academia to Industry in conjunction with Jordan West from Basho Inc., at RICON 2014, Las Vegas, United States of America, October 2014.

Managing the topology of unstructured overlay networks. at 1st DEIC PhD Day, Instituto Superior Técnico, Technical University of Lisbon, Portugal, 5th of July 2013.

Managing the topology of unstructured overlay networks. at GRASCOMP 2012 - Doctoral School Day in Cloud Computing, Université Catholique de Louvain, Louvain-la-Neuve, Belgium, 20th of November 2012.

Managing the topology of unstructured overlay networks. at Eurecom - Networking and Security Group, Sophia-Antipolis, France, 2nd of October 2012.

Aplicação da informática na criação de um dicionário - case study: Lexicon at the Colóquio “Lexicografia e Semântica Lexical: caminhos a seguir na feitura de um Dicionário de Grego”, 24 and 25 November 2006, Faculdade de Letras da Universidade de Lisboa, Lisboa, Portugal

Other Oral Presentations

Participant in the *Think Distributed Panel* at RICON 2014, Las Vegas, USA, 29th of October 2014.
Topic of the panel: *Collaboration between Academia and Industry*.

Participant in the *Sharing Experiences Round Table* at the 3rd PhD Day of the Department of Informatics in IST, 7th of July 2014, Oeiras, Portugal.

Professional Activities

PC Member

The 22nd International Conference on Principles of Distributed Systems (OPODIS), December 2018, Hong Kong.

Track de Segurança de Sistemas de Computadores e Comunicações, in INFORUM 2018.

Track de Computação Paralela Distribuída e de Larga Escala, in INFORUM 2018.

The 36th IEEE International Symposium on Reliability and Distributed Systems (SRDS), September 2017, Hong Kong.

Track de Segurança de Sistemas de Computadores e Comunicações, in INFORUM 2017.

Track de Computação Paralela Distribuída e de Larga Escala, in INFORUM 2017.

Track de Segurança de Sistemas de Computadores e Comunicações, in INFORUM 2016 (PC Co-Chair).

Track de Computação Paralela Distribuída e de Larga Escala, in INFORUM 2016.

Track de Computação Paralela Distribuída e de Larga Escala, in INFORUM 2015 (PC Co-Chair).

Ninth Workshop on Middleware for Next Generation Internet Computing (MW4NG) collocated with the 15th International Middleware Conference 2014.

Fifth Workshop on Planetary-Scale Distributed Systems (W-PSDS) collocated with the SRDS'19 International Conference.

Third Workshop on Planetary-Scale Distributed Systems (W-PSDS) collocated with the SRDS'15 International Conference.

Second Workshop on Planetary-Scale Distributed Systems (W-PSDS) collocated with the SRDS'14 International Conference.

First Workshop on Planetary-Scale Distributed Systems (W-PSDS) collocated with the SRDS'13 International Conference.

Journal Reviewer

ACM Transactions on Computer Systems.

IEEE Transactions on Parallel and Distributed Systems.

Elsevier Computer Communications.

Wiley Software: Practice and Experience.

Conference and Journal External Reviewer

IEEE Transactions on Parallel and Distributed Systems.

International Symposium on DIStributed Computing (DISC) - 2008.

International Symposium on Distributed Objects, Middleware, and Applications (DOA) 2007/2008/2009.

IEEE Workshop on Dependable Parallel, Distributed and Network-Centric Systems (DPDNS) - 2009.

Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN) - 2007/2009/2013.

International Conference on Distributed Computing Systems (ICDCS) - 2010/2012.

IEEE International Parallel & Distributed Processing Symposium (IPDPS) 2008.

ACM/IFIP/USENIX International Middleware Conference (Middleware) 2007/2008.

International Conference On Principles Of DIstributed Systems (OPODIS) 2008/2009/2011/2015.

ACM Symposium on Principles of Distributed Computing (PODC) 2010/2013.

IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO) 2009.

International Symposium on Reliable Distributed Systems (SRDS) 2007/2010.

International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS) 2009.

Portuguese Symposium on Informatics (INFORUM) 2012/2013.

International Conference on Multicore Software Engineering, Performance, and Tools (MUSEPAT) 2013.

Conference and Workshop Organizations

Chair / Co-Chair

Fifth Workshop on Planetary-Scale Distributed Systems, September 2019. Lyon, France (Co-located with SRDS 2019). (*Co-Chair*)

Third Workshop on Planetary-Scale Distributed Systems, September 2015. Montreal, Canada (Co-located with SRDS 2015). (*Co-Chair*)

Computação Paralela Distribuída e de Larga Escala (CPDLA) Track of INFORUM 2015, 7 and 8 of September, Portugal. (*Co-Chair*)

Second Workshop on Planetary-Scale Distributed Systems, October 2014. Nara, Japan (Co-located with SRDS 2014). (*Co-Chair*)

First Workshop on Planetary-Scale Distributed Systems, September 2013. Braga, Portugal (Co-located with SRDS 2013). (*Co-Chair*)

Local Organization Chair

2nd ACM Symposium on Cloud Computing, 2011, Cascais, Portugal.

Registration Chair

23rd ACM Symposium on Operating Systems Principles (SOSP) 2011, Cascais, Portugal.
 ACM/IFIP/USENIX 12th International Middleware Conference 2011, Lisboa, Portugal.

Proceedings Chair

Conference on Principles of Distributed Systems (OPODIS), December 2017, Lisboa, Portugal.

Other

Member of the ACM, 2008–Present.
 Member of the IEEE, 2008–Present.
 Member of the Usenix, 2010–Present.

Advising*Ph.D. Students*

Filipe Freitas (as Co-Advisor. Advisor: Rodrigo Rodrigues, FCT-UNL).
 Thesis Topic: Consistency in Large-Scale Distributed Systems.

M.Sc. Students (Finished)

Vasco Coelho. (As Co-Advisor. Advisor: Vitor Duarte)
 Research Topic: Improving Memory Management in Distributed Caching Systems.

Miguel Madeira (As Co-Advisor. Advisor: Bernardo Ferreira).
 Research Topic: Password Protection

David Mealha (As Co-Advisor. Advisor: Maria Cecília Gomes. Co-Advisor: Nuno Preguiça)
 Research Topic: Dynamic Management of Data Replication in Microservice Architectures.

André Carrusca (As Co-Advisor. Advisor: Maria Cecília Gomes)
 Research Topic: Dynamic Management of Services in Microservice Architectures.

António Silva – Industrial Thesis Unbabel (As Co-advisor. Advisor: João Costa Seco)
 Research Topic: Framework for Supporting automatic Translation of Mobile Apps.

Manuel Cruz – Industrial Thesis DNS.PT (As Co-Advisor. Advisor: Jos Legatheaux Martins) Research Topic:
 Understanding the Behavior of DNS Resolvers.

Gonalo Tomás.
 Research Topic: Performance Evaluation for Large-Scale Replicated Storage Systems.

Pedro Ákos Costa.
 Research Topic: Computations in the Edge.

Francisco Magalhães.
 Research Topic: Membership Services for Cloud-Edge Systems.

Filipe Luis
 Thesis Topic: A collaborative Peer-to-Peer Queuing System.

Francisco Fernandes
 Thesis Topic: Improving Web-Caching Systems with Transparent Client Support.

Pedro Fouto (Co-advised with Nuno Preguiça)

Thesis Topic: Providing Causality in Large-Scale Partially Replicated Systems.

José Venâncio (Co-advised with João Leite and Teresa Romão)

Thesis Topic: A Tool for Online Debates.

Flávio Fernandes

Thesis Topic: Highly Robust Unstructured Overlay Networks for Geo-Distributed Settings.

Pedro Durães (Co-advised with Nuno Preguiça)

Thesis Topic: Integration of Browser-to-Browser Architectures with Third Party Legacy Cloud Storage.

Tiago Costa

Thesis Topic: Security and Privacy in Browser-to-Browser Web Applications.

André Sampaio

Thesis Topic: Partial Decentralized Photo Gathering based on Facial Recognition in Mobile Environments.

David Lopes (as Advisor. Co-Advisor: Rodrigo Rodrigues, FCT-UNL).

Thesis Topic: Eventually Consistent Database Replication based on Conflict-Free Replicated Data Types.

Natacha Leitão (as Co-Advisor. Advisor: Francisco Couto, FC-UL).

Thesis *Development of a Scalable, Precise, and High-Coverage Genomics Mapping Tool for NGS*.

FC, University of Lisbon, 2015.

Albert Linde (as Co-Advisor. Advisor: Nuno Preguiça, FCT-UNL).

Thesis *Enriching Web Applications with Browser-to-Browser Communication*. FCT, Nova University of Lisbon, 2015.

Mauro André Mendes Silva (as Co-Advisor. Advisor: Carlos Ribeiro, IST-UL (formerly IST-UTL).

Thesis *MobUser: An User-Centric Platform for information sharing among mobile devices*.

Technical Institute, Technical University of Lisbon, 2012.

Ph.D. Students (Ongoing)

Luis Silva (as Co-Advisor. Advisor: Nuno Preguiça, FCT-UNL).

Thesis Topic: Architectural Support for Mobile Edge Systems.

Pedro A. Costa (FCT-UNL).

Thesis Topic: Autonomic Computing on Cloud-Edge Systems.

Pedro Fouto (as Advisor. Co-Advisor: Nuno Preguiça, FCT-UNL).

Thesis Topic: Consistency in Large-Scale Distributed Systems.

Albert van der Linde (as Co-Advisor. Advisor: Nuno Preguiça, FCT-UNL).

Thesis Topic: Hybrid cloud and browser-to-browser web-based architectures.

M.Sc. Students (Ongoing)

André Rosa.

Research Topic: Communication Primitives for Wireless Ad Hoc Systems.

Nuno Morais.

Research Topic: Decentralized Resource Management for Cloud-Edge Systems.

Bruno Anjos.

Research Topic: Distributed Scheduling for Cloud-Edge Systems.

Pedro Silvestre (Co-Advised with Asterios Katsifodimos from TU-DELFT).

Research Topic: Reliable Streaming Computing.

Khrystyna Fedyuk.

Research Topic: A Scalable and Robust Microservice Registry for Cloud-Edge Systems.

Paulo Dias.

Research Topic: Scalable and Decentralized Causa-Dissemination.

Paulo Moita.

Research Topic: Modular Distributed Datastorage Systems.

João Carvalho Research Topic: Data Dissemination in Blockchain Systems

Miguel Almeida (Co-advised with Sandra Ingrez from Create IT).

Research Topic: Machine Learning Techniques for Understanding Cloud Client Behaviors.

Miguel Cordeiro (Co-advised with Vitor Duarte).

Research Topic: Improving Distributed Caching Infrastructures.

Rodrigo Graças (Co-advised with João Costa Seco).

Research Topic: Measuring the Load Performance of a Complex Web Application

Others

5 students have completed a curricular research internship under my advising.

More than 10 students have completed a curricular industry internship under my supervision.

Participation in Examination Committees

As External Element

Ruma Paul. KTH, Sweden & Université Catholique Louvain la Neuve, Belgium (2016)

Thesis: *Building Distributed Systems for High-Stress Environments using Reversibility and Phase-Awareness*.

Bruno Filipe Prudêncio Inácio. Faculdade de Ciências. Universidade de Lisboa (2016)

Thesis: *Quanto valem os metadados?* (Advisors: Francisco Couto and João Ferreira).

Francisco Nuno Teixeira Neves. Escola de Engenharia. Universidade do Minho (2015)

Thesis: *Análise de desempenho e otimização do Apache HBase para dados relacionais* (Advisors: José Orlando Pereira and Ricardo Vilaça).

João Miranda. Escola de Engenharia. Universidade do Minho (2015)

Thesis: *Replicação de Bases de Dados Baseadas em Comunicação em Grupo* (Advisors: Ricardo Vilaça and Ana Nunes Alonso).

Vítor Hugo Gonçalves Martins. Faculdade de Ciências. Universidade de Lisboa (2015)

Thesis: *Towards an Engaging Social TV on a Second Screen*. (Advisor: Francisco Couto).

Carlos André Freitas Barata. Faculdade de Ciências. Universidade de Lisboa (2014)

Thesis: *Impacto de Obras Literárias nas Redes Sociais*. (Advisor: Francisco Couto).

Marcel Henrique dos Santos. Faculdade de Ciências. Universidade de Lisboa (2014)

Thesis: *Dependable Data Storage With State Machine Replication* (Advisor: Alysson Bessani).

As Internal Element

Valter Balegas. Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa (2017)

Ph.D. Committee.

Bernardo Ferreira. Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa (2016)

Ph.D. Committee.

Honors, Awards, & Fellowships

Best Professor of the Informatics Department 2018/2019, FCT, NOVA University of Lisbon (Awarded by Student Council by student votes).

Best Professor of the Informatics Department 2016/2017, FCT, NOVA University of Lisbon (Awarded by Student Council by student votes).

Amazon AWS for Education Grant. Awarded \$1,000 in Cloud Computing Time for Research (2014).

Co-author of the Best Student Paper Award at the The 12th IEEE International Symposium on Network Computing and Applications (IEEE NCA13) with the paper: *Rollerchain: a DHT for Efficient Replication*.

Best Paper Award at the Portuguese Third Symposium on Informatics (2011) with the paper: *Transferência de Dados entre Grupos de Processos no Modelo BAR*.

Student Grant for attending the COST 295 Dynamo, Discussion Workshop and MC Meeting.

Ph.D. Grant from the Fundação para a Ciência e Tecnologia (2008).

Student Grant for attending the COST 295 1st Workshop on Dynamic Networks (2007).

Student Grant for attending the 37th Annual IEEE/IFIP international Conference on Dependable Systems and Networks (DSN07).

Research Projects

Principal Researcher or Coordination Team:

LightKone - Lightweight computations for networks at the edge.

Technical Lead at FCT UNL. FCT UNL Local Co-coordinator. Workpackage Leader (WP5).

Coordinator: Peter van Roy, Universit Catholique de Louvain (UCL) in Louvain-la-Neuve, Belgium

Financed by the European Union under the H2020 grant agreement ID 732505.

NG-STORAGE - New Generation of data STORage And manaGement systEms.

Principal Researcher.

Financed by FCT under contract PTDC/CCI-INF/32038/2017 (starting October 2018).

Secure and Scalable Platform for Massive-scale Mobile Applications.

Co-Principal Researcher. Principal Researcher: Nuno Preguia (NOVA LINC & FCT UNL).

Financed by FCT under contract PTDC/CCI-INF/32662/2017.

HiPSTr: High-Performance Serializable Transactions.

Co-Principal Researcher. Principal Researcher: Joo Loureno (NOVA LINC & FCT UNL).

Financed by FCT under contract PTDC/CCI-COM/32456/2017

Cosmos: Causal Consistency on the Network Edge.

NOVA FCT UNL Local Coordinator. Principal Researcher: Lus Rodrigues (INESC-ID & Tcnico UL)

Financed by FCT under contract PTDC/EEI-COM/29271/2017

Member of Research Team:

SyncFree - Large-scale computation without synchronisation.

European research project taking place for 3 years, starting October 2013, funded by the European Union, grant agreement n. 609551.

Hyrax: Crowd-Sourcing Mobile Devices to Develop Edge Clouds.

Founded by FCT under grant (CMUP-ERI/FIA/0048/2013).

PEPITA - Adaptação de Topologia com Preservação de Propriedades.

Founded by FCT under grant (PTDC/EEI-SCR/2776/2012).

ADAAS - Assuring Dependability in Architecture-based Adaptive Systems.
Founded by FCT under grant (CMU-PT/ELE/0030/2009).

HPCoLSI - High-Performance Computing over the Large-Scale Internet.
Founded by FCT under grant (PTDC/EIA-EIA/102212/2008).

REDICO - Dynamic reconfiguration of communication protocols.
Founded by FCT under grant (PTDC/EIA/71752/2006).

P-SON: Probabilistically-Structured Overlay Networks.
Founded by FCT under grant (POSC/EIA/60941/2004).

Miscellaneous

Other Activities

Member of *Student Council* while an undergraduate student in Faculdade de Ciências - Universidade de Lisboa.

Member of the *Pedagogical Council* while an undergraduate student in Faculdade de Ciências - Universidade de Lisboa.

One year studies of Japanese (at the New University of Lisbon) (2006/2007).

Last updated: October 8, 2019