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TIAGO TRAVASSOS VIEIRA VINHOZA
http://tiagotvv.github.io

MAIN INTERESTS: DATA SCIENCE, MACHINE LEARNING, DATA ANALYSIS, STATISTICS

EMPLOYMENT

Machine Learning Specialist   **INESC Technology and Science, Portugal**   **Sep. 2014 – Nov. 2015**

- Developed an algorithm to change the topology of a pre-existing Bayesian Network to improve its performance. In our specific case, the aim was to improve prediction of breast cancer based on mammogram reports. The refined network would be presented to the specialist to evaluate if the changes make medical sense. This approach lead the team to work closer to clinicians and to get insights from data related to the prediction of breast cancer.
- Built and compared other predictive models for breast cancer using classification algorithms such as SVMs, Naïve Bayes, and Decision Trees.

Data Mining and Signal
Processing Expert   **Instituto de Telecomunicações, Porto, Portugal**   **Jun. 2012 – May 2014**

Worked as part of the DigiScope (Digitally Enhanced Stethoscope for Clinical Usage) team
- The work focused on creating a set of features from heart sounds collected with an electronic stethoscope. The goal was to detect anomalies in heartbeats such as presence of heart murmurs. Features included medically relevant information such as location and intensity of the first and second heart sounds (systole and diastole) and signal specific such as signal energy. These features are used in conjunction with demographic information from the patients to train predictive models to assess their heart condition. Several techniques are used throughout each stage of this process, such as: statistical signal processing, feature engineering, clustering and classification algorithms such as logistic regression, SVMs, Naïve Bayes, and Decision Trees.

Wireless Communications
and Networking Researcher   **Instituto de Telecomunicações, Porto, Portugal**   **Dec. 2008 – Jun. 2012**

Member of the Distributed Routing and Infotainment through Vehicular Inter-Networking project (9/2009 – 6/2012)
- Proposed a vehicle-to-vehicle (V2V) communications channel model that accounts for vehicles as 3D obstacles and assessing their impact on vehicular ad-hoc network performance metrics. The conclusion was that other vehicles are the most significant source of signal attenuation and variation in highway environments. The proposed mathematical model was validated using real world measurements from vehicle-to-vehicle communications signals.

Worked on Network Coding for Robust Architectures in Volatile Environments project (12/2008 – 12/2010)
- Worked in two fronts. First, investigated the delay distribution of random linear network coding using a Markov chain model. After that worked on information theoretic security aspects of coding and devised a practical scheme that relies on coding to provide a robust and low complexity solution for achieving a prescribed level of confidentiality in environments subject to failures and partially compromised by an adversary.

Post-Doc Researcher   **Pontifícia Universidade Católica do Rio de Janeiro**   **Jan. 2008 – Aug. 2008**

- Channel Estimation and receiver design for OFDM and multicarrier CDMA systems

Rio de Janeiro, RJ Brazil   Pontifícia Universidade Católica do Rio de Janeiro   1995-1999, 2001-2007

- Ph.D. in Electrical Engineering, 2007
- M.Sc. in Electrical Engineering, 2003
- Diploma in Electrical Engineering, 1999.
- Relevant Coursework: Random Processes, Statistical Theory of Communications, Information Theory, Detection and Estimation, Neural Networks, Linear Algebra, Calculus, Communications Networks, Communication Systems.

Most Relevant Journal and Conference Publications

- E. Almeida, P. Ferreira, T. T. V. Vinhoza, I. Dutra, Y. Wu, E. Burnside, "ExpertBayes: Automatically Refining Manually Built Bayesian Networks", International Conference on Machine Learning and Applications,Detroit, MI, USA, 2014.
- J. Pedrosa, A. Castro, T. T. V. Vinhoza, "Heart Sound Segmentation and Murmur Detection in Pediatric Phonocardiograms", Proc. of the IEEE EMBC 2014, Chicago, IL, USA, 2014.
- P. F. Oliveira, L. Lima, T. T. V. Vinhoza, M. Medard, J. Barros "Coding for Trusted Storage in Untrusted Networks", IEEE Transactions on Information Forensics and Security, December 2012.
- M. Boban, T. T. V. Vinhoza, M. Ferreira, J. Barros, O. K. Tonguz, "Impact of Vehicles as Obstacles in Vehicular Adhoc Networks", IEEE JSAC (Special issue on Vehicular Communications and Networks), January 2011

- **Teaching:** Taught full-credit graduate level Information Theory course. University of Porto (Winter 2010)**.** TA of several graduate and undergraduate level courses at PUC-Rio (1 per semester from 2002-2008): Random Processes, Probabilistic Models, and Statistical Theory of Communications, among others.

- **Additional Coursework (MOOC):** _Coursera_: Machine Learning, R Programming, Exploratory Data Analysis, Data Analysis and Statistical Inference, _edX_: Learning from Data.

- **Awards:** Ciência 2008 research contract by the Portuguese Foundation for Science and Technology, Full M.Sc (2001) and Ph.D. scholarships (2003), Academic Excellence Certificate (1999).

- **Certificate of Advanced English (CAE):** University of Cambridge – grade: A.

- **Side Project**: Portuguese Legislative Election Simulator (2016). http://tiagotvv.github.io/app/vote.html – Main goal was to learn HTML, JavaScript, CSS.

- Knowledge of Python (numpy, scipy, scikit-learn, pandas, seaborn)
- Knowledge of R
- MATLAB/Simulink, WEKA
- Entry level programming skills in Java, HTML, JavaScript, CSS