

Ana Paula Diniz Marques

PHD CANDIDATE

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SUMMARY

PhD candidate on School of Electrical and Computer Engineering at University of Campinas (UNICAMP), Brazil. Research interests and focus are on Mathematical Modeling, Simulations and Applied and Computational Mathematics, Ecological and Environmental Modeling. Work with agricultural problems since 2011, such as crop control strategies and optimization, spread of pathogens and vectors, and animal diseases. Current research is about a citrus disease, named HLB or Greening, using Individual-Based Model to investigate the spatial dispersion of psyllids (disease's vector). During the undergraduate studies (Bachelor in Applied and Computational Mathematics) worked at the Computational Mathematics Laboratory on Brazilian Agricultural Research Corporation (EMBRAPA), with a Brazilian 'Scientific Initiation' fellowship (CNPq). At EMBRAPA, developed a deterministic compartmental model for Equine Infectious Anemia (EIA) disease, analyzing the transmission behavior between the vector of EIA and the horses.

EDUCATION & RESEARCH EXPERIENCE

- UNICAMP (Universidade Estadual de Campinas)

School of Electrical and Computer Engineering

PHD Student in ELECTRICAL ENGINEERINGAdvisor: Professor Takaaki Ohishi - taka@densis.fee.unicamp.br

- Modeling complex systems with the interplay of a large number of agents. Work with Individual-based modeling, Pattern-oriented modeling and Statistical analysis.

Campinas, Brazil
 Aug. 2015 – Aug. 2019
 (Expected)

- TUD (Technische Universität Dresden)

Institute of Forest Growth and Forest Computer Sciences

Institute of Forest Growth and Forest Computer Sciences

Guest Scientist

Advisor: Professor Uta Berger

- Worked with development, analysis, and parametrization of Individual-based models. Used local sensibility analysis methods, Morris Screening, Full Factorial Design, and Optimization methods.

Dresden, Germany
 Mar. 2017 - Jan. 2018

- UNICAMP (Universidade Estadual de Campinas)

School of Electrical and Computer Engineering

MSc in ELECTRICAL ENGINEERING

Advisor: Professor Takaaki Ohishi

- Master's Thesis: A simulation model for the dispersion of Huanglongbing (HLB) disease in an orchard. (text in Portuguese) [LINK](#)

Campinas, Brazil
 Mar. 2013 - Aug. 2015

- EMBRAPA (Brazilian Agricultural Research Corporation)

Embrapa Agriculture Informatics ▪ Computational Mathematics Laboratory

Research InternshipAdvisor: PhD Sônia Ternes - sonia.ternes@embrapa.br

- Worked with deterministic compartmental models solving the system of differential equations for the Equine Infectious Anemia (EIA) disease.

Campinas, Brazil
 Oct. 2011 - Dec. 2012

- UNICAMP (Universidade Estadual de Campinas)

Institute of Mathematics, Statistics and Scientific Computing

BSc in APPLIED and COMPUTATIONAL MATHEMATICS

- Undergraduate monograph: 1st) Mathematical Epidemiology of the Equine Infectious Anemia (text in Portuguese) [LINK](#)
- Undergraduate monograph: 2nd) Review of mathematical models for the study of diseases caused by a lentivirus with iatrogenic transmission (text in Portuguese) [LINK](#)

Campinas, Brazil
 Mar. 2007 - Dec. 2012

AWARDS & GRANTS

EUROPEAN SOCIETY FOR MATHEMATICAL AND THEORETICAL BIOLOGY (ESMTB) TRAVEL SUPPORT – A grant to attend the ECMTB 2018 Conference, July 2018.

ERASMUS MUNDUS PROGRAMME - (Euro-Brazilian Windows + Project) A grant to undertake a Doctorate mobility of 10 months at the Technische Universität Dresden.

INTERNATIONAL RESEARCH CONFERENCE ON HLB (IRCHLB) TRAVEL ASSISTANCE – A grant to attend the IRCHLB V, March 2017.

FUTURO CIENTISTA - 1st place among presented works at the 6th Interinstitutional Undergraduate Studies Conference IARC, Regional APTA, IAC, ITAL and Embrapa – CIIC 2012.

LANGUAGES & SKILLS

Portuguese – Native Speaker; **English** – Advanced (C1); **German** – Basic (A2)

Software / Tools – Advanced: R, Matlab, Jupyter Notebook, NetLogo, LaTeX

Intermediary: Python

Basic: C

WRITTEN WORKS

Full paper accepted in proceedings of conferences

Marques, A.P.D.; Ternes, S.; Vilamiu, R.G.D.; Nogueira, M. F.. Mathematical Epidemiology of Equine Infectious Anemia (EIA). International Symposium on Mathematical and Computational Biology - BIOMAT, 2012, Tempe, Arizona, USA. Abstracts Annual meeting of the society for mathematical biology. Rio de Janeiro: BIOMAT Institute for Advanced Studies of Biosystems, 2012.



Expanded Summary published in proceedings of conferences

Marques, A.P.D.; Ohishi, T.. A simulation model for the dispersion of Huanglongbing (HLB) disease in an orchard. SOLABIMA - IX Congresso Latinoamericano de Biomatemática, Botucatu, SP, Brazil, 2015.



Marques, A.P.D.; Ternes, S.; Vilamiu, R.G.D.; Nogueira, M.F.. Mathematical Model for study of the EIA transmission dynamics with a mutuca vector. 6th Interstitiutonal Undergraduate Studies Conference – CIIC 2012. (text in Portuguese)



Summary published in proceedings of conferences

Marques, A.P.D.; Ohishi, T. Spatial dispersal patterns of citrus disease (HLB) and its vector. 11th European Conference on Mathematical and Theoretical Biology, Lisbon, Portugal, 2018.



Marques, A.P.D.; Ohishi, T.. Individual-Based Modeling: Simulating the spatial dispersion of HLB and the effects of epidemic on orchard yield under different scenarios of psyllid's migration and sanitary management. Journal of Citrus Pathology 4(1), 5th International Research Conference on Huanglongbing, Orlando, FL, USA, 2017.



Vilamiu, R.G.D.; Ternes, S.; Marques, A.P.D.; Nogueira, M.F.. The Role of Horseflies in the Prevalence of Equine Infectious Anemia (EIA) in the Brazilian Pantanal. International Conference on Mathematical Methods and Models in Biosciences (BIOMATH), Sofia, Bulgaria, 2013.



EXTRACURRICULAR ACTIVITIES, PARTICIPATION IN SCHOOLS & CONFERENCES

ECMTB 2018 - 11th European Conference on Mathematical and Theoretical Biology

Faculdade de Ciências da Universidade de Lisboa

Lisbon, Portugal

Jul. 2018

Presented work: Spatial dispersal patterns of citrus disease (HLB) and its vector.

11th Annual Summer School in Individual/Agent-Based Modeling

Instructors Uta Berger (TUD, Germany), Volker Grimm (UFZ, Germany), and Steve Railsback (HSU, USA).

Holzshau, Germany

Jul. 2017

5th International Research Conference on Huanglongbing

Florida Citrus Mutual, UF/IFAS University of Florida

Orlando, USA

Mar. 2017

Presented work: Individual-Based Modeling: Simulating the spatial dispersion of HLB and the effects of epidemic on orchard yield under different scenarios of psyllid's migration and sanitary management.

School on Pathogen Dynamics, Climate and Global Change

International Centre for Theoretical Physics - South American Institute for Fundamental Research (ICTP-SAIFR)

São Paulo, Brazil

Jan. 2015

Developed group work during the school: Dynamics of low pathogenic avian influenza in wild ducks under temperature fluctuations.

II Southern-Summer School on Mathematical Biology

ICTP South American Institute for Fundamental Research (ICTP-SAIFR)

São Paulo, Brazil

Jan. 2013

IV Bioinformatics Course: Algorithms and computational techniques for building and analyzing genomes - 30 hours.

LaCTAD (Laboratório Central de Tecnologias de Alto Desempenho em Ciências da Vida) – Unicamp

Campinas, Brazil

Feb. 2011

INTERESTS & HOBBIES

- Macro photography and Nature photography;
- Jogging;
- Origami.