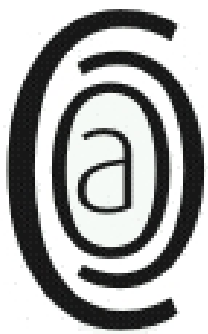


# COCA – Applied Cognitive Computing Group

Grupo de Computação Cognitiva Aplicada – COCA

Computer Science Department – UDESC

April 2, 2018

# Introduction

Applied Cognitive Computing can be summarized as all methods and heuristics that are capable of solving real world problems in an intelligent and/or optimized way. Examples of paradigms are Artificial Neural Networks, Expert Systems, Evolutionary Computing, Swarm Intelligence, ... and so on!

# Team Members

- Claudio Cesar de Sá
- Fernando Deeke Sasse (DMAT)
- Rafael Stubs Parpinelli (leader)
- Rogério Eduardo da Silva (Trinity College – Ireland)
- Other Collaborators: Lucas H. Negri (IFMS)

# Fernando Deeke Sasse


- PhD, University of Waterloo, 1997
- fernandodeeke@gmail.com and www.deeke.org
- Departamento de Matemática, CCT- UDESC
- Research Groups at UDESC: COCA and Mathematical Physics.


# Academic Activities

- Wave equation in curved space-time.
- Gröbner bases.
- Pedagogical aspects of Special and General Relativity.
- Fractional calculus applied to viscoelastic problems.
- Research Groups at UDESC: COCA (Cognitive Computation) and Mathematical Physics.

# Teaching Activities

- Numerical Analysis.
- Complex Analysis.
- Vector Analysis.
- Ordinary Differential Equations.
- History of Mathematics.
- Distance education in mathematics (YouTube: Sasse)

# Claudio Cesar de Sá


- Dr., Technological Institute of Aeronautics, 1997
- claudio.sa@udesc.br
- Departamento de Ciência da Computação, CCT- UDESC
- Research Group at UDESC: COCA


# Academic Activities

- Artificial Intelligence $\rightarrow$ applied to solve real problems
- Combinatorial (Discrete) Optimization
- Modelling with Constraint Programming: PICAT and Minizinc
- Declarative Languages
- Free Hardware and Software

# Teaching Activities

- Mathematical Logic
- Theory of Computation
- Formal Methods
- Foundations of Constraint Programming
- Programming Languages

# Additional Activities

- Enrolled in Free Software Community
- General coordination: Contest Programming of ACM in UDESC
- Consulting of some enterprises: essentially courses
- Currently, developing an embedded system with free software for a *start-up*

# Electrical Panels, Wires and Constraints

Figure 1: Real Panel

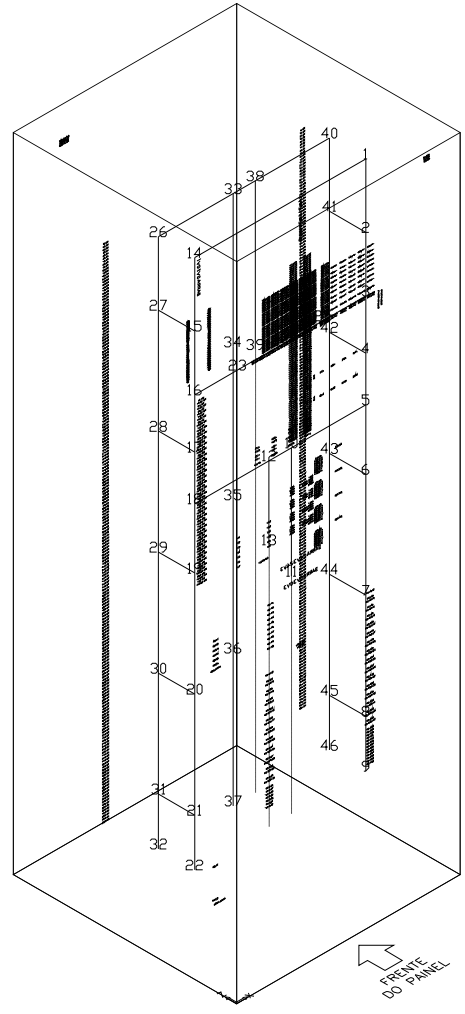



Figure 2: The panel and its complexity

# Cellular Automata Applied of Tumor Envolving

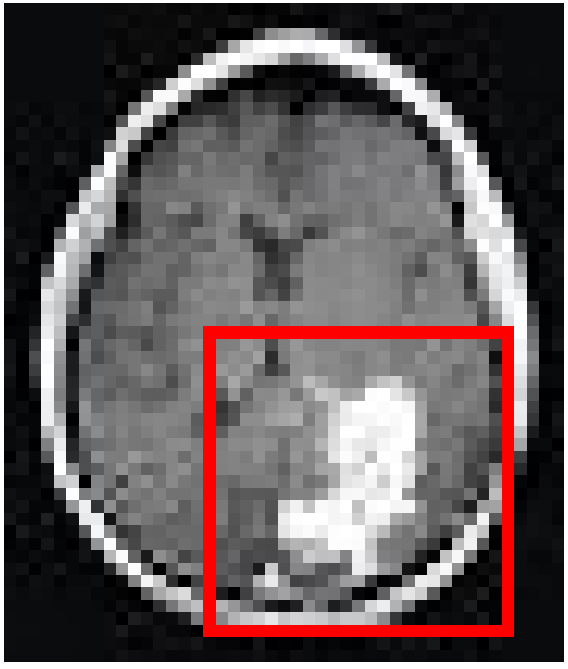


Figure 3: The real initial state

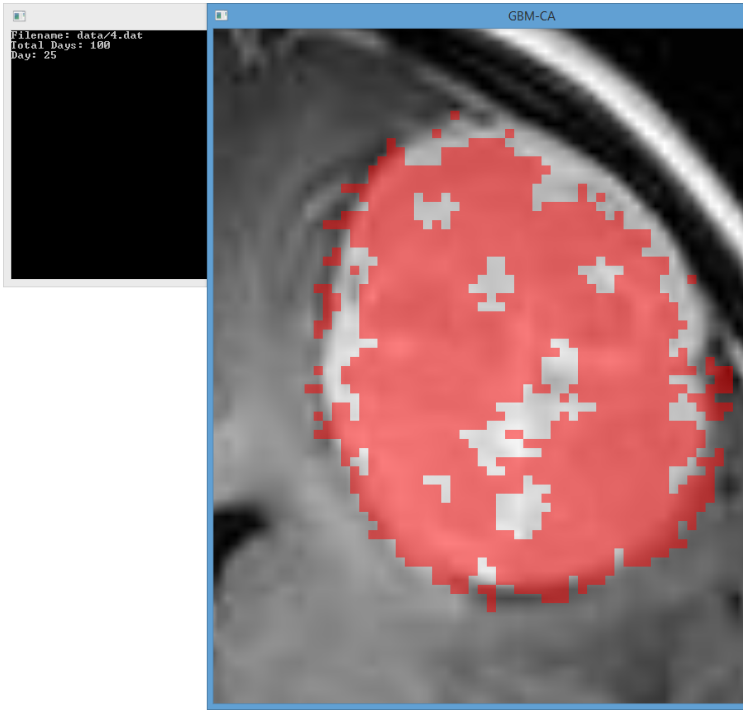



Figure 4: The simulation

# Rafael Stubs Parpinelli


- Dr., Federal Technological University of Paraná, 2013
- rafael.parpinelli@udesc.br
- Department of Computer Science, CCT - UDESC
- Graduate Program in Applied Computation, CCT - UDESC
- Research Groups at UDESC: COCA and Group of Control and Systems (Department of Electrical Engineering).


# Academic Activities

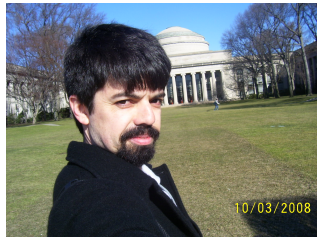
- Head of COCA (together with Prof. Claudio)
- Research Projects concerning the application of Computational Intelligence in:
  - Optimization of Complex Problems.
  - Data Mining.
  - Bioinformatics.
  - Development of new Bio-inspired algorithms.
- Tutoring: 2 Undergraduate Students, 2 Scientific Initiation Students, 3 Graduate Students (M.Sc.).
- Reviewer of IEEE Transactions on Evolutionary Computation, IEEE Transactions on Systems, Man and Cybernetics, and others.
- Program Committee member of several events.

# Teaching Activities

- Evolutionary Computation.
- Swarm Intelligence.
- Artificial Intelligence.
- Natural Computing.
- Discrete Mathematics.

# Rogério Eduardo da Silva


- Ph.D, University of Minho/Portugal, 2014
- rogerio.silva@udesc.br and `http://www.rogerioesilva.net/`
- Department of Computer Science, CCT - UDESC
- Research Groups at UDESC: COCA

# Academic Activities

- Researches Multi-Agents Systems applied to Interactive Digital Storytelling systems that consider:
  - Knowledge Representation and Reasoning
  - Computational Psychology
  - Affective Computing
  - Autonomous Agents
  - Virtual Humans
- Tutoring: 1 Undergraduate Student, 3 Scientific Initiation Students
- Check it out! `http://drama.musa.cc/`

# Teaching Activities

- Mathematical Logic
- Multi-Agents Systems
- Data Structures II

# Our site and this presentation:


- `http://www.joinville.udesc.br/coca/` → Members
- Thank you so much!