



Social Robotics for Education

Débora Muchaluat Saade and Marcelo Rocha

MediaCom Laboratory, e-Health Lab

**Institute of Computing
Fluminense Federal University**



About the Federal Fluminense University

- **Founded in 1960 • MEC**

Institutional Concept: 5 (maximum) • 132 Undergraduate Courses • 106 Postgraduate Courses

(stricto sensu) • 216 Postgraduate Courses (lato sensu) •

More than 76,000 Students • More than 3,400 Professors •

More than 3,700 Administrative

Technicians • 42 Teaching Units

• **Institute of Computing - IC**



About the Institute of Computing

- Department of Computer Science •

66 Professors •

Undergraduate Program:

• Computer Science

• 930 students

Information Systems

• 620 students

• Higher Education Technology Course in

Computer Systems • Blended Learning

• 2000 students



About the Institute of Computing

- **New undergraduate course in Artificial Intelligence and Data Science being created!**
- **Postgraduate Program in Computer Science (PGC)**
 - Master's Degree
 - Doctorate •
 - Excellence Program – CAPES • Top 12 in Brazil!



Presentation

- **Débora Christina Muchaluat Saade**

- Full Professor at the Institute of Computing/UFF • Coordinator of the Postgraduate Program in Computing • Coordinator of the MídiaCom (2003) and e-Health Lab (2024) Laboratories • **Education:** • Computer Engineer - PUC-Rio • Master's and PhD in

Computer Science -
PUC-Rio

- **Main areas of activity:**

- Multimedia •
Computer Networks • Digital Health •
**Socially Assistive
Robotics**



Educa 360 Project



- Funding from FAPERJ • Valid from 2022 to 2026



- Research and Innovation in Multisensory Experiences for Education
- Partnership



Educa 360 Project Team



- **Débora Christina Muchaluat Saade** - UFF/Computer Science
- Coordinator

• Célio V. Neves de Albuquerque - UFF/Computer Science • Cláudia Maria Lima Werner - UFRJ/COPPE • Flávia Coimbra Delicato

- UFF/Computer Science • Cristina Maria Carvalho Delou -
UFF/Education • Diogo Menezes Ferrazani Mattos - UFF/

Engineering • Flávio Luiz Seixas - UFF/Computer Science • Joel A.
Ferreira dos Santos - CEFET/RJ/Computer Science •

Luciana C. de Castro Salgado - UFF/Computer Science • Natalia Castro
Fernandes - UFF/Engineering

- postdocs, graduate students, undergraduates and teaching
average



• **Marcelo Rocha**, PhD student in
Computing

Renan , Pedro Lucas, Pedro Moreira, and João Vitor, undergraduate
students in Computer Science.

• Iasmim Santos - high school student



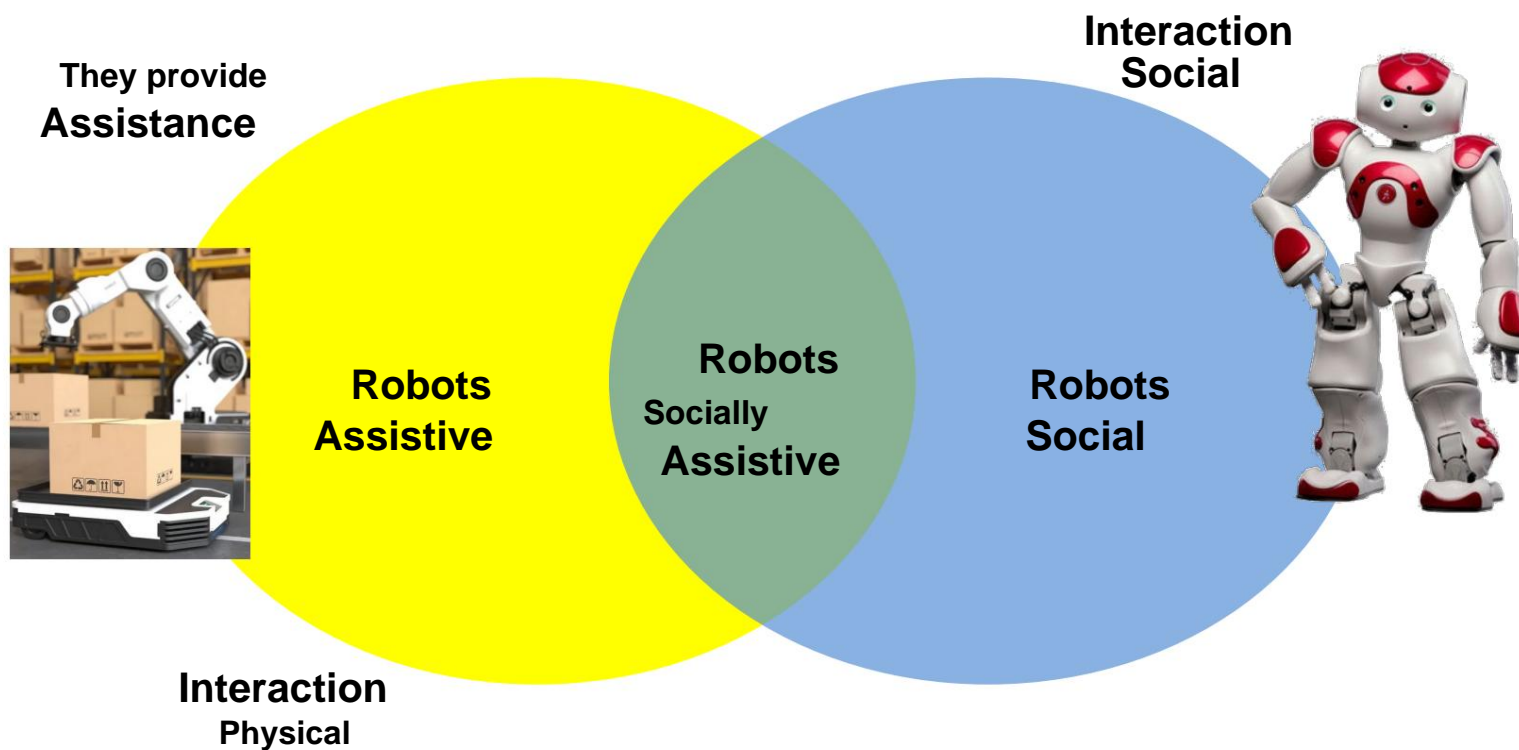
Educa 360 Project

- **Our mission:**  To bring UFF closer to public schools (partnership with [#IncludeMeninas](#))  To bring technologies developed by UFF to aid learning in schools
- Using **social robotics** to promote thinking Computational skills in middle and high school students

Include 
Meninas



Socially Assistive Robotics



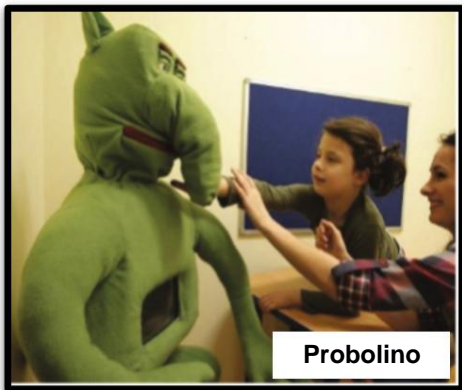
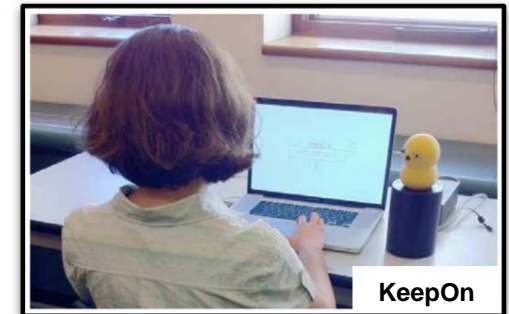
Socially Assistive Robotics



Health

APPLICATIONS

Education



Socially Assistive Robots - SARs

- ***Socially Assistive Robots (SARs)*** •

Capable of improving the physical and cognitive abilities of humans through stimuli caused by interaction with the robot.

- SARs have been used in health therapies • **The Educa 360 project focuses on applying them to the education of children/young**

EVA Robot



EVA Robot



COMMUNICATION VERBAL

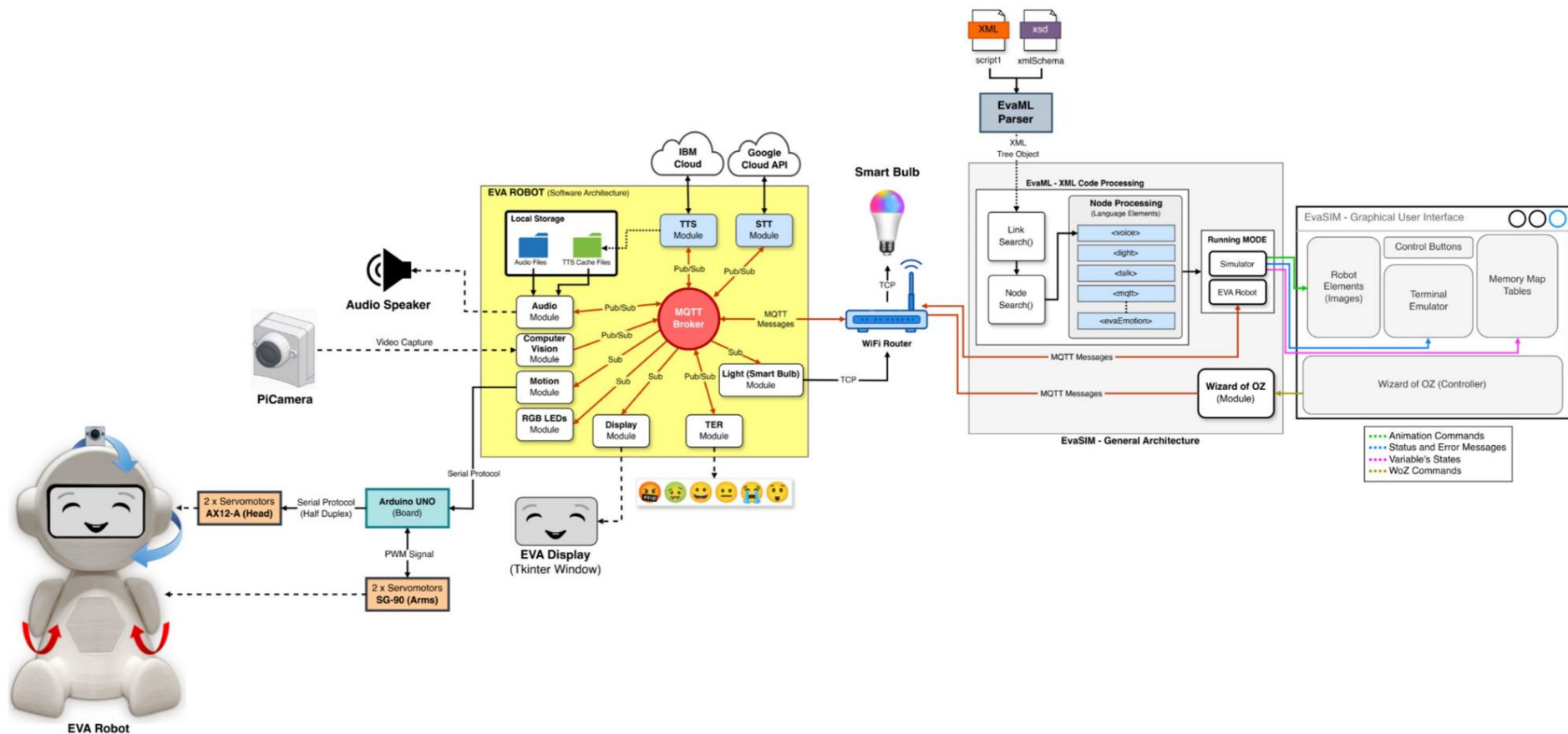
- voice recognition
- speaks

COMMUNICATION NON-VERBAL

- Expression through the eyes •
Movement of the head and arms
- Animation with LEDs and smart
lights • Recognition of
User's facial expression • QR
code reading

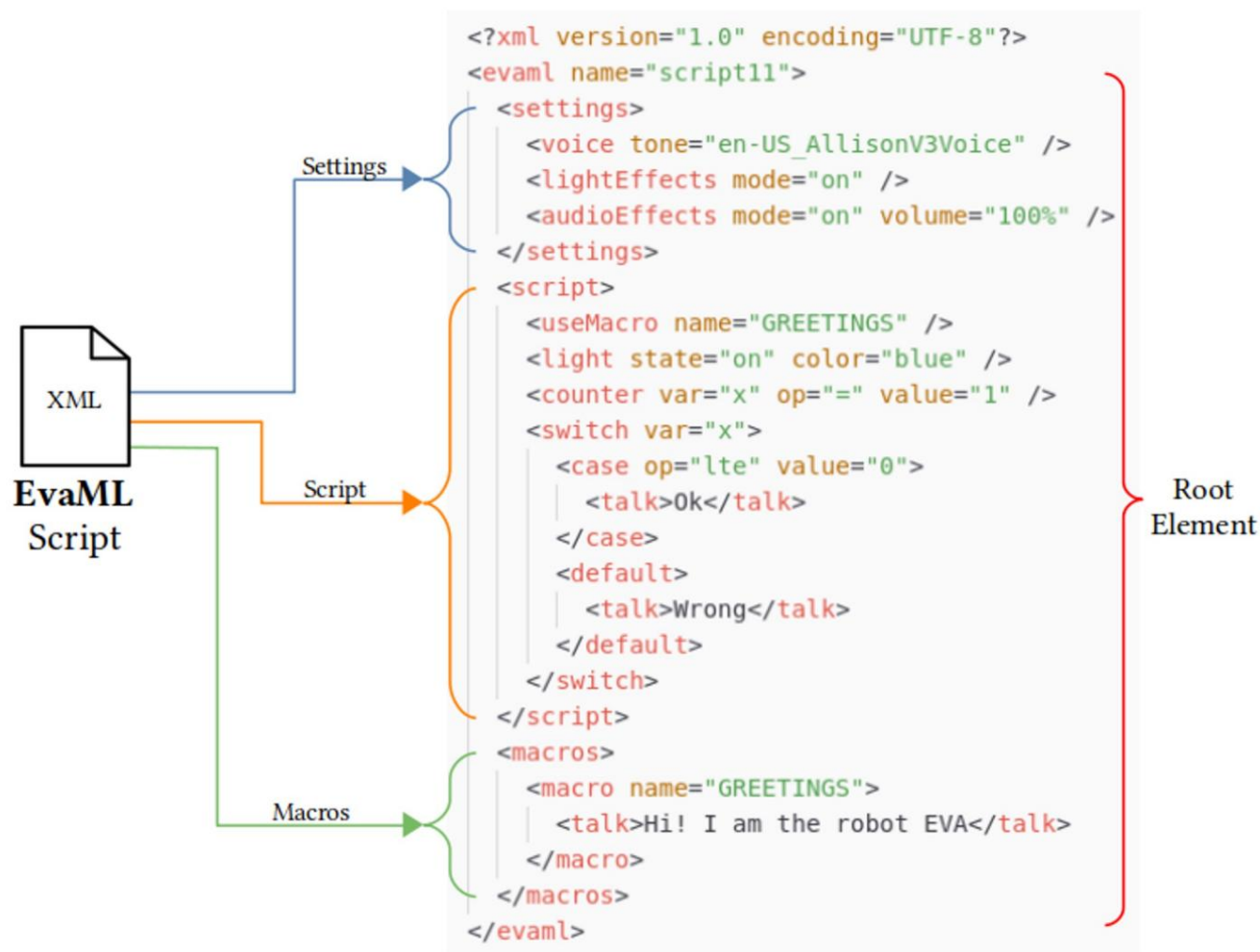


Platform for Controlling Social Robots



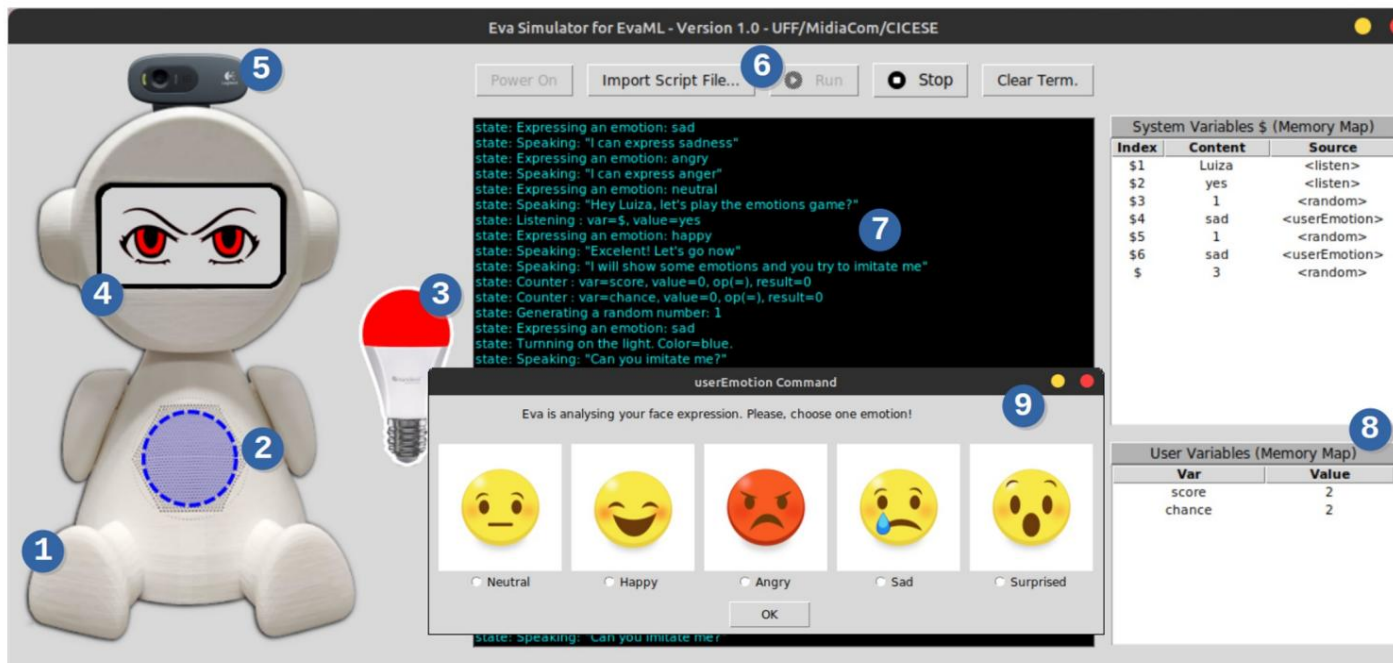
EvaML Programming Language

- Domain-specific language (DSL) based on XML



EvaSIM and Eva Virtual Simulator

- To test programs developed in EvaML





Partnership with Schools

- **Develop computational thinking**
- **Teach programming concepts to students**
- **Encourage the use of social robotics in schools**
- **Collaborate in the teaching-learning process**

Educa 360 Project

- Partnership with Project **#IncludeGirls**
- Educa 360 Hackathon in 2024 • Public Schools of Niterói • Paulo Assis State School
Ribeiro
- Altivo César Municipal School • Alberto Torres Municipal School
- **Programming Marathon**
 - Teams designed applications to use the EVA Robot in schools
 - They learned the language and programmed in EvaML.
 - Testing the programs on the robot.



Hackathon Educa 360 - 2024





Social Robotics for Education

Thank you very much! Any questions?

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