

# David Steeven Villa Salazar

## Computer Science Master Student



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### PERSONAL PROFILE

Steeven Villa is a computer science master student at UFRGS (Porto Alegre, Brazil) since March 2017, where also takes part of ANNELIDA project lead by PETROBRAS as interface-designer. His research experience is in the field of Physics-based Animation, Virtual reality, Haptic Feedback, 3D and Tangible User Interfaces. He is currently doing an internship at the Rainbow team at Inria (Rennes, France) developing projects related to mid-air and wearable haptics. He received his bachelor degree in Mechatronic Engineering from the Instituto Tecnológico Metropolitano (Medellin, Colombia) in 2016. His principal research interest area is Human-computer interaction.

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### EDUCATION

#### MSc. in Computer Science | UFRGS

Universidade Federal do Rio Grande do Sul (Brazil)

Jan. 2017 - In progress

Thesis (Provisory Title): Integrating Physics-based and Data-Driven Methods to Accurately Model Haptic Textures

Adviser: Prof. Dr. Anderson Maciel

#### BSc. in Mechatronic Engineering | ITM

Instituto Tecnológico Metropolitano (Colombia)

Aug. 2010 - Dec 2016

Main Research: Computer Simulation of Heat Transfer on Tools Used in Friction Stir Welding

Adviser: Prof. Dr. Edwar A. Torres Lopez

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### RESEARCH INTEREST

#### Haptics

Texture Modeling & Rendering | Wearables | Mid-Air Haptics | Multi-sensory perception

#### Physical-Based Animation

Position-Based Dynamics | Smoothed Particles Hydrodynamics | Deformable Bodies

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### PARTICIPATION IN RESEARCH PROJECTS

#### As Master Student

H-Reality

INRIA Rennes | 2019 - Present

Hapto-Graphic Unified Engines for Simulated Medical Interventions

Universidade Federal do rio grande do sul | 2018 - 2019

Desenvolvimento de um robô para operação em dutos de 4" a 10"

Development of a robot for operation in a submarine pipeline of 4" to 10".

Universidade Federal do rio grande do sul | 2017 - 2019

#### As Bachelor Student

Comparison of methodologies to get phase values in the optical field in lensless digital holographic microscopy

Universidad Nacional de Colombia | 2015 - 2016

Modeling and nonlinear control of fluids dynamics as from an experimental module

Instituto Tecnológico Metropolitano | 2014 - 2015

Fluid-Dynamic computational study of spiral chambers applied to micro-scale hydropower generation.

Instituto Tecnológico Metropolitano | 2014 - 2015

Computer simulation of heat transfer on tools used in friction stir welding

Instituto Tecnológico Metropolitano | 2013 - 2014

Development numerical correlations of heat transfer and pressure drop in twisted tube heat exchanger

Instituto Tecnológico Metropolitano | 2013 - 2014

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## PROFESSIONAL EXPERIENCE

### Research Intern

INRIA - Rennes-France

Current

Hardware Prototyping | Human Perception | Haptics | Wearable Devices

### Physical Interface Designer

PETROBRAS - Porto Alegre-Brazil

2017 - Present

Hardware Prototyping | Human Factors | Design for Explosive Atmospheres

### Cadd Designer & CFD Assistant

COINGAS - Itagui-Colombia

2015 - 2016

Simulation Planning | Numerical model implementation | Petroleum Simulations

### UI Designer & Hardware Integrator

PITMMAM - Medellin-Colombia

2015

Hardware Prototyping | UI Planning | Interaction Design | Wireless Communication

### Young Researcher

Instituto Tecnológico Metropolitano - Medellin-Colombia

2014 - 2015

Image Processing | Machine Learning | Research | Teaching

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## LANGUAGES

Spanish (Native)

Portuguese (Good)

English (Good)

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## TECHNICAL SKILLS

### Programming Languages

C++

Python

Matlab

C#

Processing

### Digital tools

OpenGL

OpenCV

Unity 3D

3D Cadd Design

CFD Simulation

FEA Simulation

## Physical tools

Arduino  
Raspberry pi  
BeagleBone

Microcontrollers  
Circuit Design

## Haptic and VR Devices

Geomagic Touch  
Ultrahaptics  
HTC Vive

Oculus Rift  
Vicon Tracking

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## PUBLICATIONS AND INVITED TALKS

Heat-Based Bidirectional Phase Shifting Simulation using Position-Based Dynamics (Full Paper)  
Computers & Graphics 2018.

VILLA, D.; TICONA, J.; TORCHELSEN, R; MACIEL, A.; NEDEL, L.

Ambientes inmersivos: ¿Cómo hacer real lo virtual? (Talk)

Immersive environments: How to make the virtual, real?

1er Workshop creciendo en ciencia 2018. (Medellin-Colombia)

VILLA, D.

Evaluation of Visual, Auditory and Vibro-Tactile Alerts in Supervised Interfaces (Full Paper)

20TH SYMPOSIUM ON VIRTUAL AND AUGMENTED REALITY 2018

SOUZA, G.; AMAYA, L.; STEIN, V; VILLA, D.; TICONA, J.; MACIEL, A.; NEDEL, L.

3DAthlon: 3D Gestural Interfaces to Support a 3-Stage Contest in VR (Short Paper)

IEEE Conference on Virtual Reality and 3D User Interfaces 2018.

GRANDI, JJ; DEBARBA, H; FRANZ, J; OLIVEIRA, V; TICONA, A; SOUZA, G; BERTI, I; VILLA, D; NEDEL, L; MACIEL, A.

Computer Simulation of Heat Transfer on Tools Used in Friction Stir Welding. (Full Paper - Spanish)

Revista UIS Ingenierias (2015): vol. 14, no 2, p.p. 19-26.

VILLA, D.; HINCAPIE, D. y TORRES, E.

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## PARTICIPATION IN STUDENT CHALLENGES

### UltraMotion | UTRAHAPTICS Challenge

VILLA, D.; OLIVEIRA, V. | EUROHAPTICS 2018 | Pisa, Italia | Finalist

### 3DAthlon | 3DUI Contest

CG-UFRGS Team | IEEE 3DUI | Reutlingen, Germany | Finalist

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## AWARDS

RESOLUCION N348 POR MEDIO DE LA CUAL SE CONCEDE MENCIÓN AL MÉRITO POR ACTIVIDADES DE INVESTIGACIÓN A UNOS ALUMNOS DE LA FACULTAD DE INGENIERÍAS (Research Award)

ITM (Colombia) | 2014