Rafael Henrique Tibães

Living in Curitiba, studying in Salvador, Brazil

+55 41 98844-8118 • r@fael.nl • fael.nl
Brazilian and Portuguese citizenship.

Software Developer with experience in Biometrics, Machine Learning, Computer Vision and High Performance Computing. Graduated in Computer Science and now pursuing a Master degree with focus on biometric solutions for newborn identification. However, my favorite field of study is video processing, specifically motion analysis and scene understanding problems.

Previous Employment

- **Akiyama Soluções Tecnológicas** — **Curitiba, Brazil**
  Computer Vision Scientist — *2015–current*

  The company provides biometric solutions, such as fingerprint, face and signature recognition. I work on research and development of new algorithms, and also in the integration with the leading commercial frameworks and devices.

- **IMAGO Research Group, Federal University of Paraná (UFPR)** — **Curitiba, Brazil**
  Academic Researcher — *2008–2015*

  I dedicated myself on studying computer vision problems: object detection, recognition and tracking; motion analysis, behavioral and action recognition; scene understanding; optical flow; face detection and recognition; and 3D reconstruction.

Education

Academic Qualifications

- **Federal University of Bahia** — **Salvador, Brazil**
  Master in Computer Science — *2016–ongoing*
- **Federal University of Paraná** — **Curitiba, Brazil**
  Bachelor in Computer Science — *2008–2012*
- **Udacity Nanodegree** — **Online**
  Machine Learning Engineer — *2017–ongoing*

Notable Projects

- **Masters Project (Ongoing):** *'Fingerprint matching algorithm targeting newborn identification'*

  In partnership with the company Akiyama, we are developing a complete solution for fingerprint identification focusing on newborns. It requires a sensor capable of higher resolutions, as the fingerprint information is smaller in newborns. Also, the matching algorithm must be robust to the scale deformation caused by the aging.

- **Akiyama ICAO (Ongoing):** *'Face Segmentation using low-cost 3D cameras'*

  To comply with IEEE and ICAO protocols of face enrollments in conditions of non-controlled background, we adopted a low-cost 3D camera based on structured light. However, in the hair region the sensor provides a poor depth information, so I am working on a novel algorithm to segment the hair region based on color and depth information.

- **Motion Analysis:** *'From tracking to scene understanding'*

  My first contact with computer vision was in a project where a PTZ camera should track a subject. This is a challenging task, that includes object detection and tracking, optical flow, and image stabilization, just to name a few. I continued the study to scene understanding, motion analysis and behavior modeling, which I consider one of the most interesting topics in vision.

- **Monograph:** *'High Performance Face Detection'*

  With the hype of programming on graphic units (GPUs), I studied both OpenCL and CUDA, in addition to algorithm profiling, parallel programming and advanced computer architecture. I applied this study to optimize our algorithm of face detection in depth images using graphic units. In this work using an early version of OpenCL we managed to achieve a ten times speed up over the original version of the software.

Technical and Personal skills

- **Communication Skills:** Good communication skills acquired through working experience on a research team specialized in different areas, like informatics, healthcare and arts; presentation of projects on seminars and teaching assistance. Languages: Portuguese is my mother tongue; English, full business proficiency (B2); German, basic user (A1).
- **Developer Skills:** C++ along with OpenCV, DLib, Halide, OpenCL and CUDA libraries; Enthusiast of Julia, Apple Swift, Wolfram Mathematica, Python, Node.JS, and Unix Shell.
- **Researcher Skills:** My expertise is in development of real-time Biometric solutions: face, iris, fingerprint, signature, emotion, behavior and motion analysis. To perform pattern recognition over images and videos, I studied Machine Learning concepts, such as supervised, unsupervised, reinforced and deep learning. As a Computer Vision researcher, I worked with a range of cameras: webcams (traditional RGB), Bumblebee (stereo vision), Breukmann (structured light), Microsoft Kinect (structured infrared light) and Kinect One (time of flight), Intel RealSense (structured infrared light), PanTiltZoom Axis, professional Canon cameras, lenses and programming via CHDK, GoPro, and security cameras with night vision. Real-time video processing is challenging, so I also studied the key principles of the High Performance Computing, i.e. parallel programming and architecture optimizations.
- **DevOps Skills:** Management of Linux and FreeBSD servers; domain name (DNS); Docker containers; local Git or remote with GitHub, GitLab or BitBucket; cloud VPS with DigitalOcean, Google Compute Engine or Microsoft Azure; continuous integration and delivery; team communication and reporting with Slack, Office365, Google Apps, Dropbox, Jupyter and ShareLatex.

Interests and extra-curricular activities

- Deep interest in cool hardware stuff, such as drones, 3d printers, robotics and raspberry pi.
- Active within the Hackathon community. Currently my team is working on the great idea we had in our last event. I am developing the iOS app and helping with the backend.
- Bass player of a garage band. We like to play mainly international pop, folk and rock.
- I like sports. Taekwondo, bikes and tennis are my favorites. Unfortunately, I am not a good tennis player.

Awards

- Best Computer Science work at UFPR undergraduate research event in the years 2009, 2011 and 2012.
- 11th place in the ACM International Collegiate Programming Contest, South America, 2012
- 67th place (out of 1515 teams) in the IEEEXtreme Programming Competition 5.0, 2011