Rafael Henrique Tibães

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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 biometrics.

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 — *2017–2018*

Notable Projects

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

  At 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.

- **JuliaBiometrics (Ongoing):** *'Open Source Julia Package for Biometrics.'*

  This project is an open source package for biometrics operations using Julia language. The key idea is to provide a simple and powerful biometric API to the public, making it easier to develop both private and public algorithms modules. Public modules on Github: https://github.com/JuliaBiometrics

- **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.

Technical and Personal skills

- **Communication Skills:** Good communication skills acquired through working experience on a research team specialized in different areas, like informatics, health-care 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:** My favorites languages are Julia and C++. OpenCV and Scikit-Learn are the libraries that I use the most. I adventure myself in Flutter, GTK, Qt, AngularJS, Caffe, TensorFlow, JuliaPlots, ArrayFire, OpenCL and CUDA.
- **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 servers; DNS; Docker; Git on GitHub, GitLab or BitBucket; cloud VPS with Digital Ocean or Google Compute Engine; continuous integration and delivery; team communication and reporting with Asana, Slack, Office, Google Apps, Jupyter and Latex.

Interests and extra-curricular activities

- Deep interest in cool hardware stuff, such as drones, 3d printers, robotics and raspberry pi.
- Active within the Hackathon and OpenSource communities.
- 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