tiagokatcipis

software engineer

contact

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languages skill

English: advanced (reading, writing); intermediate (speaking)

programming languages

C, C++, Go, Python, Lua, Nash, Bash, Javascript

protocols

DBus, RTMP, HTTP, SIP, RTP, AMQP

cloud

Kubernetes, AWS, Azure, Docker, CoreOS, Terraform

documentation

Gtk-Doc, Doxygen, Docbook, LDoc, LaTeX, Docco

automation

Ansible, Make

dev environment

Vagrant, Docker Compose

monitoring

Prometheus, Grafana, StatsD, Sysdig

education

2006–2011 **Bachelor of Computer Science** UFSC

experience

2018–2019 **Neoway** Florianópolis, Santa Catarina

Software Engineer - Lambda Team

As a software engineer on the lambda team I was responsible for researching and developing new captcha solvers (audio and image). Solving audio captchas involved studying and applying the following algorithms and tools:

- Noise removal using sox
- Audio segmentation by silence using sox
- Extracting features (MFCC) from segmented audio
- Normalize extracted features with rescaling
- Train SVM model
- Recognize characters using trained SVM model
- Label image captchas using TensorFlow

Main accomplishments:

- Development of tool to measure assertiveness of captcha solving services
- Solved audio captcha with 80% of assertiveness
- Solved image captcha with 40% assertiveness using TensorFlow
- Tooling to automate dataset and trained models upload at Azure BlobFS

2017–2018 **Neoway** Florianópolis, Santa Catarina

Software Engineer - Data Platform Team

As a software developer on the data platform team I started to be responsible for a more broad context involving multiple teams, building not only services but also tooling to be used by those teams.
Besides the technical challenges of providing a platform I also performed code reviews and coaching across multiple teams. There was a lot of challenges like:

- Migrating the entire infrastructure of multiple teams from AWS to Azure
- Defining network topology and security measures
- Creating backups for VMs with different operational systems at Azure
- Specify a new DSL to develop web scrappers
- Scale the ingestion of huge CSV files (terabytes per file)
- Define solutions for infrastructure building that crossed multiple teams boundaries

Main accomplishments:

- Fully automated infrastructure provisioning at Azure
- Easy to build parallel version of the entire infrastructure (including networking and security)
- Development and testing of a library to automate infrastructure building
- Specified and developed generic backup strategy at Azure
- Entire infrastructure access through a bastion host as a security measure
- New service that allowed arbitrarily huge files to be ingested easily (scaling horizontaly)

2015–2017 **Neoway** Florianópolis, Santa Catarina

Software Engineer - Data Capture Team

Technical lead of the team responsible for capturing data from the web and publishing it to the entire company, which involved solving hard problems as:

- Scraping the web (Scrapy and Selenium)
- Parsing data from multiple formats (HTML, PDF, SWF)
- Maintaining all downloaded raw data at S3
- Defining and documenting good protocols for proper service integration
- Developing services on different languages, like Go and Python
- Migrating the whole data pipeline to a new service oriented architecture
- Coach the team on good test techniques for the new architecture
- Developed new services to provide good proxies and captcha breaking

Besides the technical challenges I also helped the team to apply some development practices, like TDD (Test Driven Development),code review and continuous integration. Together we built a DevOps culture to enable infrastructure as code on our team, we where responsible for the whole solution, from the development to testing and deployment (including monitoring the production system).

Main accomplishments:

- Technical leadership and coaching for a team of 6 people
- Built a new crawling framework, from scratch to production
- Fully automated development environment with docker compose
- Fully automated dashboard and alert creation on Sysdig Cloud
- Cluster orchestration at AWS/Azure using Kubernetes, CoreOS and Docker
- Migrating all infrastructure from Codero to AWS
- Later, migrated the infrastructure from AWS to Azure
- Active participation on building the tools to automate infrastructure on Azure
- Aided on the migration of more than 100 crawlers to Kubernetes
- Actively participated on the screening and interviews of new candidates for the team
- Coached new members
- Implemented a real time monitoring for the data production pipeline using StatsD and Sysdig
- Gave talks inside the company and on events like TDC (The Developers Conference) and GopherCon

2012–2015 **Dígitro** Florianópolis, Santa Catarina
Systems Analyst

Technical lead of the team, helping on design, implementation and testing of new and legacy software.

Development of a REST service responsible for audio streaming and audio metadata extraction.

Helping the team to apply agile development practices, like TDD, self organization and continuous integration.

Evangelizing the adoption of the DevOps culture to enable infrastructure as code on the entire organization.

Helped on the adoption of new technologies like NodeJS, defining good practices and the tool set.

Coaching new members on the team.

Main accomplishments:

- Defining the architecture and contract of a REST service from scratch.
- Implementing a REST service with TDD.
- Acquired knowledge with NodeJS, Express, Mocha, Istanbul, JSHint, Grunt.
- Integration of a NodeJS server with multiple child processes.
- Developing GStreamer plugins with TDD.
- Constructed development environments with Vagrant.
- Orchestration with Ansible.
- Performed presentations to disseminate the idea of distributed/automated development environments.
- Coaching the use of TDD on the team.
- Helping the team to introduce automated tests on legacy code.
- Coached two new members on the team.
- Usage of CRC cards to design systems.
- Contributing on the migration process from svn to git.
- Experience integrating heterogeneous systems.

2010–2012 **Dígitro** Florianópolis, Santa Catarina
Programmer

Development of a VoIP phone microservices, participating actively on the design and architecture of the solutions.

Some of the services include:

- Audio streaming with RTMP.
- Voice biometrics.
- Word searching on audio.
- REST interface for a PBX.

Main accomplishments:

- Acquired knowledge on interprocess communication using DBus.
- Object orientation in C.
- TDD on embedded C.
- Development of VoIP applications.
- Embedding Lua code on C.
- Defining the API and architecture of web services and middlewares.
- Embedded developing on blackfin platform, using uCLinux and UBoot.
- Continuous integration using Jenkins.
- Experience with document oriented databases.
- Database replication with MongoDB.

2008–2010 **Dígitro** Florianópolis, Santa Catarina
Trainee

Developing cross platform applications (Windows and Linux) for audio streaming. Development of a prototype for a voice biometrics system.
Main accomplishments:

- Cross compiling code to Windows using mingw.
- Developing a cross platform native application in Python.
- Developing a simple web server in Python.

2007-2008 **Cyclops / LAPIX** Florianópolis, Santa Catarina
Trainee

Developing new features on the DICOMizer, a system responsible to integrate medical equipment to the DICOM system.
Main accomplishments:

- Experience with C++ development and XML parsing.
- Developing a native frontend with C++ and wXwidgets.
- Automating the development environment with Python.
- Test automation using CppUnit.

open source projects

2017-now **mdtoc** https://github.com/madlambda/mdtoc
A very simple table of contents generator for markdown.

2016-2018 **nash** https://github.com/NeowayLabs/nash
Nash is a shell language focused on simplicity and having a nicer syntax than traditional shells and support to containers. It also strives to be safer than traditional shells.

2016-2018 **klb** https://github.com/NeowayLabs/klb
klb is used to automate infrastructure creation on AWS and Azure. I got involved on designing the support for Azure since this was the tool used to migrate Neoway production infrastructure from AWS to Azure.

2013 **CppUTest** http://cpputest.github.io
CppUTest is a C /C++ based unit xUnit test framework for unit testing and for test-driving code.
In this project I worked both on improving the documentation and at adding new native types to the mock framework (which involved some refactoring).

2012 **GStreamer** http://www.gstreamer.net
GStreamer is a library for constructing graphs of media-handling components. I contributed with a plugin named *removesilence* and some documentation for the GstCheck documentation.

2010-2011 **Pattern detection on H.264** https://github.com/katcipis/h264.pattern.detection
This is my Bachelor's Thesis and it consists of a prototype of a H.264 CODEC that uses OpenCV and H.264 internal algorithms to do pattern detection and object tracking integrated on the encoding process.
Metadata generated on the encoding process is integrated on the video bitstream on conformance with the standard.

2010-2011 **LuaSofia** https://github.com/ppizarro/luasofia
Lua binding for the Sofia-SIP library. Contributed to the project from the start, helping to make decisions about the design of the software and documenting it.

2010 **GPS tracking system** https://github.com/katcipis/gps.tracking
System designed to provide the location of a device at the receive of a position request using SMS.

2010 **LuaNotify** https://github.com/katcipis/luanotify
Lua library that implements a simple Pub/Sub system inspired on glib GSignal API.

presentations

2018 **Object Orientation in Go** The Developers Conference

For people that come from a background on Java or other classic object oriented languages (like C++) there is also some discussion on if Go is actually object oriented.
In this presentation I try to present Go as a language that is more object oriented than these classic languages, at least according to the original foundations of object orientation.
Presentation source can be found here.

2016 **Building Resilient Services in Go** GopherCon Brazil

Resilience is not about never failing, but how do you recover from it. How can you prevent your services from locking down or exhausting all its resources ? How to perform graceful service degradation ? Can this kind of behaviour be tested properly ?

On Go we have some new features, like Contexts, that helps us to model timeouts and cancellation properly.

They can be combined with other useful features as select and channels to model timeouts and resource pools, which can be essential to provide proper service degradation instead of total failure of the system.

On this talk I try to answer this questions using new features available on Go 1.7, direct from production ready software.

Presentation source can be found here.

2016 **Real Life Kubernetes** The Developers Conference

On this presentation we will give a short introduction on Kubernetes and show the experience of learning and using Kubernetes on production for two very distinct systems.

The first one is a data acquisition system, involving running multiple instances of different crawlers, storage services, captcha breaking services, message brokers (like RabbitMQ) and database integration outside the cluster.

The second one is a web application, involving network analysis using graphs with the ultimate goal of fraud prevention. The application is strongly bounded with the microservices architecture and the twelve factor app.

Graph and document databases, cache layers, a message broker and a distributed filesystem are some of the technologies surrounding the application ecosystem.

Presentation source can be found here.