MANFRED RAMON DIAZ CABRERA

3450 rue Hutchison, Apt 602,
Montreal, Quebec, H2X 2G5
(514) 248-8457 | takeitallsource@gmail.com | https://github.com/takeitallsource | https://takeitallsource.github.io/

PROFILE SUMMARY

- MSc. (c) in Computer Science at Concordia University.
- Assistant Researcher at the Shared Reality Lab, Centre for Intelligent Machine, McGill University, on the transformation of robotics autonomy techniques into assistive technologies for visually impaired people.
- Ten years of professional experience in software development with solid knowledge of object oriented design and software architecture.

LANGUAGE

- English (fluent).
- Spanish (native).
- French (basic, A2).

EDUCATION

MSc. Computer Science [GPA: 3.82/4.30]   **2016-2018***
Concordia University, Montréal, Québec, Canada
Supervisor: Professors Thomas Fevens & Jeremy Cooperstock (McGill)
Selected Coursework: Distributed Systems Design (COMP 6231), Applied Machine Learning (COMP 551, McGill)

BEng. Software Engineering [GPA: 5.19/5]   **2005-2010**
Universidad de las Ciencias Informáticas, Havana, Cuba.
Supervisor: Eng. Eddy Sanchez (SekureId Corporation).
Thesis: Integration Environment for Dynamic Software Solutions.
Graduated with honours, Best of Class 2010.

PUBLICATIONS

Refereed Conferences

R1. Diaz, M., Girgis, R., Fevens, T. and Cooperstock, J. To Veer or Not to Veer: Learning from Experts How to Stay Within the Crosswalk. In: *5th International Workshop on Assistive Computer Vision and Robotics (ACVR), 2017*. [project]

R2. Díaz, M. Integración de Sistemas de Gestión de Emergencias con Tecnologías Móviles. In: *Ninth LACCEI Latin American and Caribbean Conference (LACCEI'2011), Engineering for a Smart Planet, Innovation, Information Technology and Computational Tools for Sustainable Development, 2011*. [paper].

Manuscripts Under Review

U1. Girgis, R., Diaz, M., Cooperstock, J and Fevens, T. **TITLE.** In: ACM CHI Conference on Human Factors in Computing Systems*, 2018*. [UNDER REVIEW].

RESEARCH EXPERIENCE

Assistant Researcher   **2016-**
Shared Reality Lab, Centre for Intelligent Machine, McGill University

The Walking Straight Project [R1] [project]
Co-authors a Learning from Demonstration (LfD) approach to tackle the veering problem of visually impaired individuals at street intersections.

- Recollected and composed the street crossing demonstration dataset.
- Trained and evaluated different Convolutional Neural Networks architectures (*Mobilenet*, *Squeezenet*,) as a derivation technique to obtain an optimal policy for the veering problem.
- Designed and developed an Android application prototype to test different models performance for rendering real-time signals to the users.
- Integrated OpenAL library for Android to render spatialized sound cues into the guiding system.

Skills: deep learning, imitation learning, Tensorflow 1.0, Keras 2.0, Tensorflow API for Android, Android, opencv, numpy, scikit-learn, scikit, OpenAL for Android.

HONORS AND AWARDS

- Bronze Medal at Cuban Inter-College Informatic Contest (2006).
- Bronze Medal at Cuban National Informatic Contest (2004).
- Bronze Medal at Cuban National Informatic Contest (2003).

ADVISORY / SUPERVISORY EXPERIENCE

Mentor / Advisor Undergraduate Thesis
1. de la Grana, V. (2012). Software Distribution System over a Peer to Peer Solution Architecture. Universidad de las Ciencias Informáticas, Facultad II.

2. Moncada, O., Cardenas, R. (2011). Public Safety Emergency Management Solution: Operation Management Subsystem. Universidad de las Ciencias Informáticas, Facultad II.

ONLINE LEARNING

Self-driving Car Engineering   **2016**
Udacity Self-Driving Car Nanodegree Program [work]   **-**
- Term 1 Computer Vision and Deep Learning: lane detection, traffic sign recognition, behavioral cloning a.k.a imitation learning, vehicles detection.
- Term 2: Sensor Fusion, Localization and Control (ongoing)

Skills: deep learning, computer vision, imitation learning, transfer learning, Tensorflow 1.0, Keras 2.0, opencv, numpy, scikit-learn, scikit.

PROFESSIONAL EXPERIENCE

TECHNICAL STRENGTHS

Languages	C#, Java, C++, Groovy, Javascript, TypeScript, python
Frameworks	.NET, Java, node.js, Qt 5.7
Web Technologies	Grails, ASP .NET MVC, hapi, express, angular.js, Twitter Bootstrap
Desktop Technologies	WPF
Hybrid Technologies	nw.js
Databases	PostgreSQL, Oracle 10g
ORM	NHibernate, Hibernate, GORM, sequelize.js
IDE	Visual Studio, IntelliJ Idea, WebStorm, PyCharm, Eclipse, Visual Studio Code
Version Control	svn, git, Tortoise SVN & Git, SourceTree
Build Tools	gradle, cmake, MSBuild, qmake
Continuous Integration	Jenkins CI
Continuous Deployment	puppet
Operating Systems	Windows, OS X, Linux, Raspbian OS
Hardware	Raspberry Pi, Raspberry Pi Camera

EXPERIENCE

Software Developer Intern [Part-time]   June 2017 - September 2017
Anatomi Metrix, Montreal, Quebec, Canada

Worked as part of the development team of Anatomi Metrix team that implements Manu3 solution, a touchless portable desktop optical laboratory instrument to measure the anatomical dimensions of the hand and fingers.

System Calibration Tool
- Created, designed and implemented a remote system calibration tool in Qt and Qt Quick. *(Qt v5.7, C++)*
- Implemented a remote video streaming module through ssh. (*libssh2, raspivid*)
- Focus and lighting image measurement and calibration. (*opencv, ffmpeg*)
- Designed and implemented a DHCP leases extraction. (antlr4)

Measurement User Interface
- Implemented dynamic internationalization of main user interface. (Qt Linguist)
- Quality assurance testing of different released versions of the Manu3 UI.

Research & Development
- Improvements on the image segmentation algorithm using different techniques as background subtraction, contours, convex hulls, Bezier curves.
- Evaluated state of the art deep learning based segmentation techniques.

Technical environment: Qt v5.7, C++, libssh2, opencv, ffmpeg, antlr4, raspivid, git, DHCP, Bitbucket, Raspberry Pi, Raspbian Jessie, Ubuntu 16.04, Qt Creator, Qt Linguist.

Full-Stack Software Developer   **October 2014 - April 2017**
GOmentr Inc., Calgary, Alberta, Canada (*Remote*)

Works and leads as Senior Full-stack Software Developer the small team that implements the core of GOmentr, a Private Online Mentoring platform for alumni to connect and engage with schools by mentoring students.

- Implements core platform features from front-end interactions (*jQuery, knockouts.js, mustache*) to back-end functionalities (*Grails, Groovy, GORM, PostgreSQL*).
- Leads and implements refactoring of legacy parts of the system using design patterns and implementation best practices (notification, user messaging).
- Develops and maintains the indexing engine configuration (*Apache Solr*).
- Maintains *puppet*-based Continuous Deployment tasks.
- Defines technical specifications, best practices and workflows for the development team (git workflows, continuous integration, continuous deployment, technological stack, collaboration tools).

Technical environment: IntelliJ Idea 15.03, Grails Framework 2.3.11, Groovy 2.1.9, GORM, Java 1.7, PostgreSQL 9.4, HTML5, CSS3, Twitter Bootstrap, LESS, jQuery, Mustache, knockoutjs, Apache Solr, git, Jenkins CI, puppet, Atlassian Jira and Confluence, Ubuntu 14.04

Software Developer   **July 2015 - January 2016**
H3ALTH TECHNOLOGIES Inc., Calgary, Alberta, Canada (*Remote*)

Architected, led and developed a 3D Body Scanning Software. This IRAP funded project was focused on the research of body measurements and metrics for fitness purposes.

- Designed and implemented depth sensors acquisition routines using Depthsense SDK and ported it to *python* using *cpython*.
- Designed, implemented and integrated a heterogenous publish/subscribe architecture using *ZeroMQ* (*node.js* and *python*).
- Added OOP design and implementation to a legacy 3D reconstruction routine using C++, *pcl (Point Cloud Library)* and *boost*.
- Defined technical specifications, best practices and workflows for the development team (git workflows, continuous integration, continuous deployment, technological stack, collaboration tools).

Technical environment: python, C++, Javascript, nodejs, cpython, Depthsense SDK, ZeroMQ, Point Cloud Library, boost, nw.js, angularjs, cmake, git, Atlassian Jira, bitbucket, PyCharm, WebStorm, Eclipse C++.

Front-end Software Developer   **December 2014 - March 2015**
EasySoft S.A, Quito, Ecuador

Developed frontend features for the Easy Cash Management and Easy Online Personas products for the financial sector in Ecuador.

- Implemented and refactored UI components and views using *ASP .NET* and *Twitter Bootstrap*.
- Developed new features as part of the core of both products using *angularjs* and *Twitter Bootstrap*.
- Researched and designed a Continuous Integration and Delivery system using *node.js* libraries and tools for improving existing deployment and delivery practices.

Technical environment: .NET, C#, ASP .NET, Twitter Bootstrap, node.js, angularjs.

Senior Software Developer   September 2013 - June 2014
Document Management Center, UCI, Havana, Cuba

Architected, designed and developed Arkehia Lite product, a multi-environment version of Xabal Arkehia Archival Documents Management System.

- Designed and implemented an application framework based on REST and SPA paradigms as the underlying platform of the product using *express/hapi* API frameworks in the backend, *angularjs* in the frontend, and using TypeScript as primary language.
- TypeScript compiler integration for generating database entities from typed domain models using *sequelize.js*.
- Application prototyping for desktop/web multi-environment approach using *nw.js* technologies.

Technical environment: node.js, nw.js, angular.js, sequelize.js, TypeScript, coffeescript, express, hapi.

Software Architect and Consultant   November 2010 - February 2011
Public Safety Software Center, UCI, Havana, Cuba

Architected, designed and prototyped Havana Provincial Emergency Management System, a complete Emergency Management solution customized to Cuban emergency management processes.

- Audited existing architecture, design and implementation.
- Identified and defined software requirements and processes in the context of Emergency Management in Cuba.
- Architected the solution based on up to date .NET Framework technologies: WPF, Entity Framework, ASP .NET MVC, and a newer version of C# language.
- Designed and developed external services integration (geocoding, national unique id system, plate recognition) using WCF.
- Designed and developed first iteration of the Call Center Operator module.

Technical environment: .NET v4.0, C# 4.0, Entity Framework, WPF, WCF, ASP .NET MVC.

Senior Software Developer   September 2010 - August 2013
Public Safety Software Center, UCI, Havana, Cuba

Worked as Software Architect in the Public Safety Management Solution for 171 Emergency Services in Venezuela. A complete distributed desktop-based system that covered all processes of first-responders management. This project took place as a collaboration between Universidad de las Ciencias Informáticas and the Ministry of Justice of Venezuela.

- Refactored and implemented the Call Center Operator Module, using .NET WinForms, NHibernate and related technologies.
- Refined and developed features at the core application framework that supported the system (communication, threading, UI components).
- Researched, designed and implemented deployment configuration and management tools based on P2P protocols (bittorrent), WIX, and MSI technologies.
- Maintained seven core modules.

Technical environment: .NET v1.1, WinForms, NHibernate, Oracle 10g, PL/SQL, P2P, bittorrent, WIX, MSI, MSBuild

Intern Junior Developer   **June 2007 - August 2010**
Public Safety Software Center, UCI, Havana, Cuba

Worked as part-time Junior/Semi-Senior Software Developer in the Public Safety Management Solution for 171 Emergency Services in Venezuela. A complete distributed desktop-based system that covered all processes of first-responders management. This project was executed as a collaboration between Universidad de las Ciencias Informáticas and the Ministry of Justice of Venezuela.

- Designed and developed the Call Center Supervisor Module.
- Refined and refactored Call Center Operator, Configuration Management, and General Supervisor modules.
- Developed WinForm-based UI components for searching, selection and representation of real-time application state.
- Was part of the in-site deployment and support team.

Technical environment: .NET v1.1, WinForms, NHibernate, Oracle 10g, pl/sql, TCP/IP, .NET Network Programming, .NET Remoting, WMI.

    ACADEMIC AND PROFESSIONAL REFERENCES AVAILABLE UPON REQUEST