# Cristian Camilo Beltran-Hernandez

ROBOTICS RESEARCHER

## Details

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NATIONALITY
Colombia

## Links

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Google Scholar

## Skills

Robotics

Machine Learning

Deep Learning

Python

ROS

Linux

Git

Docker

Java

C++

Databases

## Languages

**Spanish**: Native

**English**: Highly Proficient

**Japanese**: Conversational (JLPT-N3)

## Profile

**Cristian Beltran-Hernandez** is a Ph.D. student at the Graduate School of Engineering Science at Osaka University working on the Robot Manipulation Laboratory. His research interests include robot motion planning, reinforcement learning, computer vision, and software development for robotics. His current research is focused on industrial robot manipulators towards automation of the manufacturing industry.

## Employment History

### Software Developer at LA CADENA RETAIL SOLUTIONS, Bogotá, Colombia
OCTOBER 2016 — MARCH 2017

Design and development of an administrative web application. Backend based on Java 8 using Spring framework. Microsoft SQL Server database. Front-end based on JavaScript ES6, React JS, Redux and Material Design. Communication based on Restful Webservices.

### Software Engineer at NETLOGISTICS, Bogotá, Colombia
AUGUST 2013 — MARCH 2016

Design and implementation of supply chain software, particularly warehouse management systems (WMS RedPrairie / JDA). Multi-language developments: Java, C#, C, Groovy, SQL Server, Oracle SQL and PL SQL.

## Education

### Ph.D. Student in Robotics & Artificial Intelligence, Osaka University, Osaka
OCTOBER 2019 — SEPTEMBER 2022

### MEng in Intelligent Systems, Osaka University, Osaka
OCTOBER 2017 — SEPTEMBER 2019

### Specialization: *Mobile Cloud Computing with Android*, University of Maryland, College Park & Vanderbilt University, Online, Coursera
JANUARY 2015 — JUNE 2015

### BSc in Computer Science, University of La Sabana, Bogotá, Colombia
FEBRUARY 2009 — AUGUST 2013

## Internships

### Research Internship at OMRON Sinic X, Tokyo, Japan
APRIL 2021 — SEPTEMBER 2021

Implementation of a **ROS**-based autonomous robotic system for industrial assembly. Additionally, developing motion controllers on top of the motion planner framework **MoveIt**.
**Results**: Our system was showcased at the World Robot Summit (WRS2020) on the Industrial Robot Category - Assembly Challenge. We obtained 3rd place and a special award from the Japanese Society of Artificial Intelligence JSAI.

### Internship at SF International, Bogota, Colombia
JANUARY 2013 — JUNE 2013

Responsibilities included: Web service development based on Java language Design, development and implementation of databases based on Oracle SQL and Microsoft SQL Server. Software development for IBM applications based on C# language

## Journal Papers

[1] Wang, Yan, **Cristian C. Beltran**-Hernandez, Weiwei Wan, and Kensuke Harada. "Hybrid Trajectory and Force Learning of Complex Assembly Tasks: A Combined Learning Framework". In: IEEE Access 9 (2021): 60175-60186.

[2] Cristian C. Beltran-Hernandez et al. "Variable Compliance Control for Robotic Peg-In-Hole Assembly: A Deep-Reinforcement-Learning Approach". In: Applied Sciences 10.19 (2020), p. 6923.

[3] Cristian C. Beltran-Hernandez et al. "Learning Force Control for Contact-rich Manipulation Tasks with Rigid Position-controlled Robots". In: IEEE Robotics and Automation Letters 5.4 (2020), pp. 5709–5716. Presented at IEEE/RSJ International Conference on Int*elligent Robots and Systems* (IROS) 2020.

## International Conferences (Peer-Review)

[4] Yan Wang, **Cristian C. Beltran-Hernandez**, Weiwei Wan, Kensuke Harada. "Robotic Imitation of Human Assembly Skills Using Hybrid Trajectory and Force Learning". In: *2021 IEEE International Conference on Robotics and Automation* (ICRA).

[5] **Cristian C. Beltran-Hernandez** et al. "Learning to Grasp with Primitive Shaped Object Policies". In: *2019 IEEE/SICE International Symposium on System Integration* (SII). IEEE. 2019, pp. 468–473.

[6] Mario Arbulu, Paola Mateus, Manuel Wagner, **Cristian Beltran**, and Kensuke Harada. "Industry 4.0, Intelligent Visual Assisted Picking Approach." In *International Conference on Mining Intelligence and Knowledge Exploration*, pp. 205-214. Springer, Cham, 2018.

## Domestic Conferences

[7] **Cristian C. Beltran-Hernandez**, Damien Petit, Ixchel G Ramirez-Alpizar, Takamitsu Matsubara, Kensuke Harada (2019). "Hybrid position-force control with reinforcement learning". In: SICE *System Integration* SI2019. Japan.

[8] **Cristian C. Beltran-Hernandez**, Damien Petit, Takamitsu Matsubara, Ixchel G Ramirez-Alpizar, Kensuke Harada (2019). "Reinforcement Learning Framework for Real-world Robotic Arm". In: *The 37th Annual Conference of The Robotics Society of Japan* RSJ2019.

[9] **Cristian C. Beltran-Hernandez**, Damien Petit, Ixchel G Ramirez-Alpizar, Weiwei Wan, Kensuke Harada (2018). "Learning to grasp with guided policy search". In: *The 36th Annual Conference of The Robotics Society of Japan* RSJ2018.

## Awards

**Academic Scholarship, Osaka**
APRIL 2017 — SEPTEMBER 2022
Academic scholarship for Master and Doctoral Course by the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT)

**WRS2020 3rd Place Assembly Challenge**
SEPTEMBER 2021
Our team O2AC placed 3rd at the World Robot Summit, Assembly Challenge.

**JSAI Award**
SEPTEMBER 2021
Recognition of our solution as a superior system in the Assembly Challenge, O2AC team by the Japanese Society of Artificial Intelligence JSAI

**Best Oral Presentation (優秀講演賞)**
DECEMBER 2019
第 20 回計測自動制御学会システムインテグレーション部門講演会 (SI2019)

**Best Paper Award Finalist**
JANUARY 2019
IEEE/SICE International Symposium on System Integrations (SII)

**Finalist of International Session Best Paper Award**
SEPTEMBER 2018
The 26th Annual Conference of the Robotics Society of Japan