Camilo ESCOBAR-VELÁSQUEZ

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Systems and Computing Engineering Department   https://caev03.github.io

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Research Interests

Software Engineering, evolution and maintenance, repository mining, **Software Testing**, automated/automatic testing of Android Apps, automated testing of Web Apps, **Visual Analytics**, software understandability, **Mobile Health**

Education

Ph.D. Engineering, 2019 - 2023
Universidad de los Andes, Colombia
Thesis Title: On improving analysis and testing of open- and closed-source Android Apps
Advisor: Mario Linares-Vásquez, Universidad de los Andes, Colombia
Co-Advisor: Gabriele Bavota, Università della Svizzera italiana, Switzerland
Commitee: Denys Poshyvanyk, Massimiliano Di Penta, Nicolás Cardoso

Ph.D. Research Fellowship, Informatics, Sept. 2020 - Aug. 2021.
Swiss Government Excellence Scholarship for Foreign Scholars
Università della Svizzera italiana
Field: Automation of Software Engineering Tasks
Advisor: Gabriele Bavota, Università della Svizzera italiana, Switzerland

M.Sc. Software Engineering, 2017 - 2018.
Universidad de los Andes, Colombia
Advisor: Mario Linares-Vásquez
Thesis Title: Automatic Analysis of Android Closed-Source apps to Support Software Engineering Tasks: The Mutation Testing Case

B.S. Systems and Computing Engineering, 2012 - 2016.
Universidad de los Andes, Colombia
Minor: Mathematics
Advisor: Jose Tiberio Hernández

Research Experience

Professional Researcher - January 2022 - June 2023

Ministery of Science; Fundación CardioInfantil; Universidad de los Andes, Colombia

Graduate Doctoral Teaching Assistant - Jan. 2019 - December. 2021

Systems and Computing Engineering Department - Universidad de los Andes, Colombia

Graduate Research Assistant - Jan. 2017 - Dec. 2018

Systems and Computing Engineering Department - Universidad de los Andes, Colombia

Teaching Experience

Assistant Professor

Mobile App Development - August 2023 - Present
Systems and Computing Engineering - Universidad de los Andes, Colombia
Web Development - August 2023 - Present
Systems and Computing Engineering - Universidad de los Andes, Colombia
Automated Software Testing - August 2023 - Present
Masters in Software Engineering - Coursera - Universidad de los Andes, Colombia
Software Engineering for Mobile Apps - August 2023 - Present
Masters in Software Engineering - Coursera - Universidad de los Andes, Colombia

Lecturer

Mobile App Development - January 2023 - June 2023
Systems and Computing Engineering - Universidad de los Andes, Colombia
Web Development - January 2023 - June 2023
Systems and Computing Engineering - Universidad de los Andes, Colombia
Automated Software Testing - January 2021 - June 2023
Masters in Software Engineering - Coursera - Universidad de los Andes, Colombia
Software Engineering for Mobile Apps - January 2023 - June 2023
Masters in Software Engineering - Coursera - Universidad de los Andes, Colombia

Teacher Assistant

Software Engineering for Mobile Apps - June 2021 - December 2022
Masters in Software Engineering - Coursera - Universidad de los Andes, Colombia
Automated Software Testing - January 2018 - December 2020
Masters in Software Engineering - Universidad de los Andes, Colombia
Mobile App Development - January 2020 - December 2020
Systems and Computing Engineering - Universidad de los Andes, Colombia

Lab Instructor

Design and Analysis of Algorithms, *Lab Instructor* - Jan. 2017 - Jun. 2017
Systems and Computing Engineering - Universidad de los Andes, Colombia

Professional Service

Organizing Comitee

The 39th International Conference on Software Maintenance and Evolution
ICSME'23, Bogotá, Colombia. https://conf.researchr.org/home/icsme-2023
The 39th International Conference on Software Maintenance and Evolution
ICSME'23, Bogotá, Colombia. https://conf.researchr.org/home/icsme-2023
The 1st Languages and Tools for Next Generation Testing Workshop
LANGETI'20, Nov 9, 2020, Sacramento, CA, USA. https://langeti.github.io/

Program Comitee

ICPC'24. TBD, 2024, Lisboa, Portugal. *PC - Research Track*
MSR'23. May 15-16, 2023, Melbourne, Australia. *Junior PC - Research Track*
MOBILESoft'22. May 22-23, 2022, Pittsburgh, PA, USA. *Tool Demo and Mobile Apps.*
ESEC/FSE'21. August 18-29, 2021, (Virtually). *Artifacts Track.*
MSR'21. May 23-24, 2021 (Virtually). *Shadow PC - Research Track*

Student Volunteer

ICST'20, Oct 24-28, 2020, Porto, Portugal.
ICSME'20, Sep 27 - Oct 3, 2020, Adelaide, Australia.
ICSE'20, July 6-11, 2020, Seoul, South Korea.
ASE'19, November 11-15, 2019 - San Diego, CA, USA.
ICSE'19 - May 25-31, 2019 - Montreal, Canada.
ICSME'18 - September 23-29, 2018 - Madrid, Spain.

Talks

On improving quality of analysis and testing for Open- and Closed-source Android App. Encuentro de Experiencias de Investigación en Ingeniería EEII2022 at Universidad de los Andes - December 2022 - Bogotá, Colombia

Enabling Automated Software Engineering Tasks for Closed-Source Android Apps. 70th Anniversary of Research and Creation at Universidad de los Andes - November 2018 - Bogotá, Colombia

Honors and Awards

Scholarship from Ministry of Science
Scholarship provided to PhD Students - Minciencias 909
Jan. 2022 - Dec. 2022 - Bogotá, Colombia

Swiss Government Excellence Scholarships for Foreign Scholars
Enabling Automated Software Engineering Tasks for Closed-Source Mobile Apps
Sep. 2020 - Aug. 2021 - Lugano, Switzerland

Google Latin American Research Award
Enabling Automated Software Engineering Tasks for Closed-Source Mobile Apps
2020 - 2021 - Bello Horizonte, Brasil

Google Latin American Research Award
Enabling Automated Software Engineering Tasks for Closed-Source Mobile Apps
2019 - 2020 - Bello Horizonte, Brasil

ACM SIGAI travel scholarship
The 34th International Conference on Automated Software Engineering
2019 - San Diego, CA, USA

Google Latin American Research Award
Enabling Automated Software Engineering Tasks for Closed-Source Mobile Apps
2018 - 2019 - Bello Horizonte, Brasil

1st Place Team Competition
Testathon - Chapter 30
April 2019 - Bogotá, Colombia

1st Place Hackaton Against Human Trafficking
FIND: A Technological Environment to fight Human Trafficking
November 2018 - Bogotá, Colombia

Journal Publications

[J5] Ravelo-Méndez, W., **Escobar-Velásquez, C.**, Linares-Vásquez, M., *"Kraken 2.0: A platform-agnostic and cross-device interaction testing tool."*, in Science of Computer Programming 2022

[J4] Mazuera-Rozo, A., **Escobar-Velásquez, C.**, Espitia-Acero, J., Vega-Guzmán, D., Trubiani, C., Linares-Vásquez, M., Bavota, G., *"Taxonomy of security weaknesses in Java and Kotlin Android apps"*, in Journal of Systems and Software 2022 (JSS'22)

[J3] **Escobar-Velásquez, C.**, Mazuera-Rozo, A., Bedoya, C., Osorio-Riaño, M., Linares-Vásquez, M., Bavota, G., *"Studying eventual connectivity issues in Android apps"*, in Empirical Software Engineering 2022 (EMSE'22)

[J2] Ravelo-Méndez, W., **Escobar-Velásquez, C.**, Linares-Vásquez, M., *"Kraken: A framework for enabling multi-device interaction-based testing of Android apps."*, in Science of Computer Programming 2021

[J1] **Escobar-Velásquez, C.**, Linares-Vásquez, M., Bavota, G., Tufano, M., Moran, K., Di penta, M., Vendome, C., Bernal-Cardenas, C., Poshyvanyk, D., *"Enabling Mutant Generation for Open- and Closed-Source Android Apps"*, in IEEE Transactions on Software Engineering 2020 (TSE'20)

Conference Publications

[C13] Mazuera-Rozo, A., **Escobar-Velásquez, C.**, Espitia-Acero, J., Linares-Vásquez, M., Bavota, G., *"Detecting connectivity issues in android apps"*, in Proceedings of the 29th IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER'22) - Research Track, Honolulu, HI, USA, March 15-18, 2020.

[C12] Ravelo-Méndez, W., **Escobar-Velásquez, C.**, Linares-Vásquez, M., *"Kraken 2.0: A platform-agnostic and cross-device interaction testing tool"*, in Proceedings of the 29th IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER'22) - Tool Demo Track, Honolulu, HI, USA, March 15-18, 2020.

[C11] Naranjo-Puentes, S., **Escobar-Velásquez, C.**, Vendome, C., Linares-Vásquez, M., *"A Preliminary Study on Accessibility of Augmented Reality Features in Mobile Apps"*, in Proceedings of the 29th IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER'22) - Early Research Achievement Track, Honolulu, HI, USA, March 15-18, 2020.

[C10] Mojica-Hanke, A., Bello-Jiménez, L., **Escobar-Velásquez, C.**, Linares-Vásquez, M., *"Crème*

de la crème. Investigating Metadata and Survivability of Top Android Apps", in Proceedings of the 29th IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER'22) - REproducibility Studies and NEgative Results Track, Honolulu, HI, USA, March 15-18, 2020.

[**C9**] **Escobar-Velásquez, C.**, Donoso-Diaz, A., Linares-Vásquez, M., *"ITDroid: A Tool for Automated Detection of i18n Issues on Android Apps"*, in Proceedings of the 8th International Conference on Mobile Software Engineering and Systems 2021 (MobileSoft'21)) - Tool Demo Track, MAdrid, Spain, May 17 - 19, 2021.

[**C8**] **Escobar-Velásquez, C.**, Riveros, D., Linares-Vásquez, M., *"Mutapk 2.0: a tool for reducing mutation testing effort of android apps"*, in Proceedings of the 28th ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering 2020 (ESEC/FSE'20) - Tool Demo Track, Sacramento, CA, USA, November 6 - 16, 2020.

[**C7**] **Escobar-Velásquez, C.**, Osorio-Riaño, M., Dominguez-Osorio, J., Arevalo, M., Linares-Vásquez, M., *"An empirical study of i18n collateral changes and bugs in guis of android apps"*, in Proceedings of the 36th IEEE International Conference on Software Maintenance and Evolution 2020 (ICSME'20) - Research Track, Adelaide, Australia, September 27th - October 3rd, 2020.

[**C6**] Bello-Jiménez, L., **Escobar-Velásquez, C.**, Mojica-Hanke, A., Linares-Vásquez, M., *"Hall-of-Apps: The Top Android Apps Metadata Archive"*, in Proceedings of the 17th International Conference on Mining Software Repositories 2020 (MSR'20) - Data Showcase Track, Seoul, South Korea, October 5-11, 2020.

[**C5**] Trujillo, M., Linares-Vásquez, M., **Escobar-Velásquez, C.**, Dusparic, I., Cardozo, N., *"Does Neuron Coverage Matter for Deep Reinforcement Learning? A Preliminary Study"*, in Proceedings of the 2nd Workshop on Testing for Deep Learning and Deep Learning for Testing 2020 (DeepTest'20) - Research Track, Seoul, South Korea, October 5-11, 2020.

[**C4**] **Escobar-Velásquez, C.**, *"Source-Codeless Testing for Android Apps"*, in Proceedings of the 13th IEEE International Conference on Software Testing, Validation and Verification 2020 (ICST'20), Doctoral Symposyum, Porto, Portugal, October 24-28, 2020.

[**C3**] **Escobar-Velásquez, C.**, Osorio-Riaño, M., Linares-Vásquez, M., *"MutAPK: Source-Codeless Mutant Generation for Android Apps"*, in Proceedings of the 34th International Conference on Automated Software Engineering 2019 (ASE'19), Tool Demo, San Diego, USA, November 11-15, 2019.

[**C2**] Ravelo-Méndez, W., **Escobar-Velásquez, C.**, Linares-Vásquez, M., *"Kraken-Mobile: Cross-Device Interaction-based Testing of Android Apps"*, in Proceedings of the 35th International Conference on Software Maintenance and Evolution 2019 (ICMSE'19), Tool Demo, Cleveland, OH, United States, October 2-4, 2019.

[**C1**] Linares-Vásquez, M., Bavota, G., **Escobar-Velásquez, C.**, *"An Empirical Study on Android-*

Related Vulnerabilities", in Proceedings of the 14th International Conference on Mining Software Repositories 2017 (MSR '17), Research Paper, Buenos Aires, Argentina, May 20-21, 2017.

Student Supervision - Undergraduate Projects

2023-II

> **Esteban Martinez-Hernandez.** Topic: *Orchestration of IoT procedures in educational environments*
> **Felipe Duque-Martinez.** Topic: *Visual Analytics*

Camila Pantoja-Gómez. Universidad de los Andes, Colombia. 2022-I.
Daniel Valbuena-Bautista. Universidad de los Andes, Colombia. 2022-II.
> Project Title: *Automatic GUI testing for android using reinforcement learning*

Camila Pantoja-Gómez. Universidad de los Andes, Colombia. 2022-I.
Daniel Valbuena-Bautista. Universidad de los Andes, Colombia. 2022-II.
> Project Title: *Automatic GUI testing for android using reinforcement learning*

Camila Pantoja-Gómez. Universidad de los Andes, Colombia. 2022-I.
> Project Title: *Automatic Multi-platform Interaction Testing for Android Using Reinforcement Learning*

Edgar Díaz-Suárez. Universidad de los Andes, Colombia. 2022-I.
> Project Title: *Automatic Multi-platform Interaction Testing for Android Using Reinforcement Learning*

Camilo Rozo-Benitez. Universidad de los Andes, Colombia. 2022-I.
> Project Title: *Automatic Multi-platform Interaction Testing for Android Using Reinforcement Learning*

Mario Andrade-Vargas. Universidad de los Andes, Colombia. 2022-I.
> Project Title: *Towards automated repairment of internationalization issues for android apps*

Andrés Donoso-Díaz. Universidad de los Andes, Colombia. 2021-II.
> Project Title: *Improving Automated i18n Testing of Android Apps*

Michael Osorio-Riaño. Universidad de los Andes, Colombia. 2020-I.
> Project Title: *Comparison and analysis between automatic exploration tools for Android applications*

Juan Domínguez-Osorio. Universidad de los Andes, Colombia. 2019-II.
> Project Title: *Automated GUI ripping for web applications*

Andrés López-Fabara. Universidad de los Andes, Colombia. 2019-II.
> Project Title: *Automated GUI ripping for web applications*

William Ravelo-Méndez. Universidad de los Andes, Colombia. 2019-I.
> Project Title: *Automated cross-app testing*