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Departamento de Ingeniería Industrial  
SIRP - Sistemas Inteligentes, Robótica y Percepción  
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## Perfil

Profesor Asociado II: Profesor titular en el departamento de Ingeniería Industrial de la Facultad de Ingeniería. Investigador y director del Centro Tecnológico de Automatización Industrial CTAI. Jefe de la sección de tecnología del departamento de ingeniería industrial. Docencia en el área de tecnología dentro de los programas de Pregrado y Maestría en Ingeniería Industrial, Mecánica, BioIngeniería y Electrónica (Sistemas de manufactura Flexible, Automatización, Factores Energéticos, Procesos Industriales, etc). Dirección y Participación en proyectos de investigación y consultoría realizados por el CTAI y el departamento de ingeniería Industrial. Investigación en el área de visión por computador aplicada a vehículos aéreos no tripulados, sistemas de manufactura flexible e industria 4.0, realidad virtual, agricultura de precisión, robótica entre otros.

## Titulaciones

Doctorado, Doctor Europeo en Automática y Robótica, Universidad Politécnica de Madrid  
Fecha de grado: 14 nov. 2011

Maestría, Magíster en Ingeniería Electrónica y de Computadores, Universidad de los Andes Colombia  
Fecha de grado: 31 may. 2005

Pregrado, Ingeniero Electricista, Universidad Nacional de Colombia  
Fecha de grado: 11 oct. 2002

## Empleo

### Profesor Asociado

Departamento de Ingeniería Industrial  
Pontificia Universidad Javeriana Sede Bogotá  
Colombia  
01 ago. 2012 → present

### Miembro grupo de investigación

SIRP - Sistemas Inteligentes, Robótica y Percepción  
Pontificia Universidad Javeriana Sede Bogotá  
Colombia  
30 ene. 2000 → present

### Miembro grupo de investigación

ZENTECH - Mejoramiento y Tecnología  
Pontificia Universidad Javeriana Sede Bogotá  
Colombia  
30 jul. 2020 → present

## Resultado de la investigación

### Dispositivo para recubrir partes energizadas

Manrique Torres, M. R. (Inventor), Garcia Sierra, R. (Inventor), Zea Forero, C. R. (Inventor), Carrión, S. A. (Inventor), Aragonez Prada, D. (Inventor), Almeyda, C. E. (Inventor) & Mondragón, I. F. (Inventor), 23 sep. 2024, IPC N.º F16L11/12, F16L5/00, N.º de patente CO2021010900, 19 ago. 2021, Fecha de prioridad 19 ago. 2021, N.º de prioridad CO20210010900

### **Haptic experience to significantly motivate anatomy learning in medical students**

Manrique Torres, M. R., Mondragón Bernal, I. F., Florez Valencia, L., Montoya Quesada, L. M., Garcia Cardona, A., Mera Lasso, C. A., Kuhlmann Ludeke, A. B. E., Guillen Olaya, J. F., Cortes Barre, M. & Gutierrez Gomez, M. L., 30 ago. 2024, En: BMC Medical Education. 24, 1, p. 1-10 10 p., 946.

### **Aerial Identification of Fruit Maturity in Amazonian Palms via Plant-Canopy Modeling**

Marin, W., Mondragon, I. F. & Colorado, J. D., ago. 2023, En: Remote Sensing. 15, 15, 3752.

### **Characterization of Rice Yield Based on Biomass and SPAD-Based Leaf Nitrogen for Large Genotype Plots**

Duque, A. F., Patino, D., Colorado, J. D., Petro, E., Rebolledo, M. C., Mondragon, I. F., Espinosa, N., Amezquita, N., Puentes, O. D., Mendez, D. & Jaramillo-Botero, A., jul. 2023, En: Sensors. 23, 13, 5917.

### **Progressive Rehabilitation Based on EMG Gesture Classification and an MPC-Driven Exoskeleton**

Bonilla, D., Bravo, M., Bonilla, S. P., Irigorri, A. M., Mendez, D., Mondragon, I. F., Alvarado-Rojas, C. & Colorado, J. D., jul. 2023, En: Bioengineering. 10, 7, 770.

### **Muscle-Like Soft Actuation for Motor-Less Robotic Exoskeletons**

Colorado, J. D., Bermeo, J. E., Cuellar, F. A., Alvarado-Rojas, C., Mendez, D., Irigorri, A. M. & Mondragon, I. F., 2023, En: Proceedings of the International Conference on Informatics in Control, Automation and Robotics. 1, p. 683-688 6 p.

### **Mechanical Performance of Commercially Available Premix UHPC-Based 3D Printable Concrete**

Medicis, C., Gonzalez, S., Alvarado, Y. A., Vacca, H. A., Mondragon, I. F., García, R. & Hernandez, G., sep. 2022, En: Materials. 15, 18, 6326.

### **Optimal Deployment of WSN Nodes for Crop Monitoring Based on Geostatistical Interpolations**

Gutierrez, E. A., Mondragon, I. F., Colorado, J. D. & Mendez Ch, D., 01 jul. 2022, En: Plants. 11, 13, 1636.

### **Aerial Identification of Amazonian Palms in High-Density Forest Using Deep Learning**

Marin, W., Mondragon, I. F. & Colorado, J. D., may. 2022, En: Forests. 13, 5, 655.

### **A comparative muscular assessment of the exoskeleton in a scaffold building operation, case study.**

Forero, C. R. Z., Gómez, S. P., Bernal, O. M. & Mondragón, I., 01 abr. 2022, En: Ingeniería y competitividad. 24, 2

### **An Immersive Virtual Reality Training Game for Power Substations Evaluated in Terms of Usability and Engagement**

Mondragón Bernal, I. F., Lozano-Ramírez, N. E., Cortés, J. M. P., Valdivia, S., Muñoz, R., Aragón, J., García, R. & Hernández, G., 01 ene. 2022, En: Applied Sciences (Switzerland). 12, 2, 711.

### **Evaluación muscular comparativa del uso de un exoesqueleto en la operación de armado de andamios, caso de estudio**

Peláez, S. A., Martínez Bernal, O. D., Muñoz, R., Mondragón, I. F. & Zea, C. R., 2022, En: Ingeniería y Competitividad. 24, 2, 13 p., e21311393.

### **AI-driven maturity stage identification of Amazonian fruits**

Marinmarin, W., Mondragon Bernal, I. F. & Colorado, J., ago. 2021, En: IEEE Latin America Transactions. 19, 8, p. 1383-1390 8 p., 9475869.

### **Assist-as-needed exoskeleton for hand joint rehabilitation based on muscle effort detection**

Castiblanco, J. C., Mondragon, I. F., Alvarado-Rojas, C. & Colorado, J. D., 01 jul. 2021, En: Sensors. 21, 13, 4372.

### **Novel feature-extraction methods for the estimation of above-ground biomass in rice crops**

Jimenez-Sierra, D. A., Correa, E. S., Benítez-Restrepo, H. D., Calderon, F. C., Mondragon, I. F. & Colorado, J. D., 01 jul. 2021, En: Sensors. 21, 13, 4369.

### **Comparison of muscular activity analysis for electrical technicians in high voltage lines using exoskeleton in the colombian industry, enel-codensa study case**

Peláez, S., Zea, C., Mondragón, I., García, R. & Hernández, G., 2021, *Human Interaction, Emerging Technologies and Future Applications III - Proceedings of the 3rd International Conference on Human Interaction and Emerging Technologies: Future Applications, IHET 2020*. Ahran, T., Taiar, R., Langlois, K. & Choplin, A. (eds.). Springer, p. 435-440 6 p. (Advances in Intelligent Systems and Computing; vol. 1253 AISC).

**EMG-based adaptive trajectory generation for an exoskeleton model during hand rehabilitation exercises**

Arteaga, M. V., Castiblanco, J. C., Mondragon, I. F., Colorado, J. D. & Alvarado-Rojas, C., nov. 2020, *2020 8th IEEE RAS/EMBS International Conference for Biomedical Robotics and Biomechanics, BioRob 2020*. IEEE Computer Society, p. 416-421 6 p. 9224328. (Proceedings of the IEEE RAS and EMBS International Conference on Biomedical Robotics and Biomechanics; vol. 2020-November).

**Velocity modulation assistance for stroke rehabilitation based on EMG muscular condition.**

Castiblanco, J. C., Arteaga, M. V., Mondragon, I. F., Ortmann, S., Alvarado-Rojas, C. & Colorado, J. D., nov. 2020, *2020 8th IEEE RAS/EMBS International Conference for Biomedical Robotics and Biomechanics, BioRob 2020*. IEEE Computer Society, p. 509-514 6 p. 9224401. (Proceedings of the IEEE RAS and EMBS International Conference on Biomedical Robotics and Biomechanics; vol. 2020-November).

**Estimation of nitrogen in rice crops from UAV-captured images**

Colorado, J. D., Cera-Bornacelli, N., Caldas, J. S., Petro, E., Rebolledo, M. C., Cuellar, D., Calderon, F., Mondragon, I. F. & Jaramillo-Botero, A., 02 oct. 2020, En: *Remote Sensing*. 12, 20, p. 1-31 31 p., 3396.

**A novel NIR-image segmentation method for the precise estimation of above-ground biomass in rice crops**

Colorado, J. D., Calderon, F., Mendez, D., Petro, E., Rojas, J. P., Correa, E. S., Mondragon, I. F., Rebolledo, M. C. & Jaramillo-Botero, A., oct. 2020, En: *PLoS ONE*. 15, 10 October, e0239591.

**EMG-driven hand model based on the classification of individual finger movements**

Arteaga, M. V., Castiblanco, J. C., Mondragon, I. F., Colorado, J. D. & Alvarado-Rojas, C., abr. 2020, En: *Biomedical Signal Processing and Control*. 58, 101834.

**Myoelectric pattern recognition of hand motions for stroke rehabilitation**

Castiblanco, J. C., Ortmann, S., Mondragon, I. F., Alvarado-Rojas, C., Jöbges, M. & Colorado, J. D., mar. 2020, En: *Biomedical Signal Processing and Control*. 57, 101737.

**A system for immersive medical and engineering training based on serious games**

Mondragón-Bernal, I. F., 2020, En: *Ingeniería y Universidad*. 24

**Computer Vision for Recognition of Fruit Maturity in Amazonian Palms Using an UAV**

Marín, W., Colorado, J. & Bernal, I. M., 2020, *Lecture Notes in Networks and Systems*. Springer, p. 31-39 9 p. (Lecture Notes in Networks and Systems; vol. 112).

**High-Throughput Biomass Estimation in Rice Crops Using UAV Multispectral Imagery**

Devia, C. A., Rojas, J. P., Petro, E., Martínez, C., Mondragon, I. F., Patino, D., Rebolledo, M. C. & Colorado, J., 15 dic. 2019, En: *Journal of Intelligent and Robotic Systems: Theory and Applications*. 96, 3-4, p. 573-589 17 p.

**3D-printed pediatric temporal bone models for surgical training: A patient-specific and low-cost alternative**

Ospina, J. C., Fandiño, A., Hernández, S., Uriza, L. F., Aragonéz, D., Mondragón, I. F., Durán, D. & Magness, J., 2019, En: *Journal of 3D Printing in Medicine*. 3, 3, p. 135-143 9 p.

**Aerial monitoring of rice crop variables using an UAV robotic system**

Devia, C., Rojas, J., Petro, E., Martínez, C., Mondragon, I., Patino, D., Rebolledo, C. & Colorado, J., 2019, *ICINCO 2019 - Proceedings of the 16th International Conference on Informatics in Control, Automation and Robotics*. Gusikhin, O., Madani, K. & Zaytoon, J. (eds.). SciTePress, p. 97-103 7 p. (ICINCO 2019 - Proceedings of the 16th International Conference on Informatics in Control, Automation and Robotics; vol. 2).

### **Semi-heterarchical architecture to AGV adjustable autonomy within FMSs**

Gonzalez, S. R., Zambrano, G. M. & Mondragon, I. F., 2019, En: IFAC-PapersOnLine. 52, 10, p. 7-12 6 p.

### **Onboard visual-based navigation system for power line following with UAV**

Cerón, A., Mondragón, I. & Prieto, F., 01 mar. 2018, En: International Journal of Advanced Robotic Systems. 15, 2

### **UAV for Landmine Detection Using SDR-Based GPR Technology**

Perez Cerquera, M. R., Colorado, J. & Mondragón Bernal, I. F., 20 dic. 2017, *Robots Operating in Hazardous Environments*. Canbolat, H. (ed.). 1 ed. IntechOpen, Vol. 1. 140 p.

### **An integrated aerial system for landmine detection: SDR-based Ground Penetrating Radar onboard an autonomous drone**

Colorado, J., Perez, M., Mondragon, I., Mendez, D., Parra, C., Devia, C., Martinez-Moritz, J. & Neira, L., 03 ago. 2017, En: Advanced Robotics. 31, 15, p. 791-808 18 p.

### **Low-altitude autonomous drone navigation for landmine detection purposes**

Colorado, J., Devia, C., Perez, M., Mondragon, I., Mendez, D. & Parra, C., 25 jul. 2017, *2017 International Conference on Unmanned Aircraft Systems, ICUAS 2017*. Institute of Electrical and Electronics Engineers Inc., p. 540-546 7 p. 7991303. (2017 International Conference on Unmanned Aircraft Systems, ICUAS 2017).

### **Real-time transmission tower detection from video based on a feature descriptor**

Cerón, A., Mondragón, I. & Prieto, F., 01 feb. 2017, En: IET Computer Vision. 11, 1, p. 33-42 10 p.

### **Manufacturing Control Architecture for FMS with AGV: A State-of-the-Art**

González, S. R., Mondragón, I., Zambrano, G., Hernandez, W. & Montaña, H., 2017, *Lecture Notes in Networks and Systems*. Springer Science and Business Media Deutschland GmbH, p. 157-172 16 p. (Lecture Notes in Networks and Systems; vol. 13).

### **Setup of the Yaskawa SDA10F Robot for Industrial Applications, Using ROS-Industrial**

Martinez, C., Barrero, N., Hernandez, W., Montañó, C. & Mondragón, I., 2017, *Lecture Notes in Networks and Systems*. Springer Science and Business Media Deutschland GmbH, p. 186-203 18 p. (Lecture Notes in Networks and Systems; vol. 13).

### **Towards Image Mosaicking with Aerial Images for Monitoring Rice Crops**

Rojas, J., Martinez, C., Mondragon, I. & Colorado, J., 2017, *Lecture Notes in Networks and Systems*. Springer Science and Business Media Deutschland GmbH, p. 279-296 18 p. (Lecture Notes in Networks and Systems; vol. 13).

### **Multispectral mapping in agriculture: Terrain mosaic using an autonomous quadcopter UAV**

Navia, J., Mondragon, I., Patino, D. & Colorado, J., 30 jun. 2016, *2016 International Conference on Unmanned Aircraft Systems, ICUAS 2016*. Institute of Electrical and Electronics Engineers Inc., p. 1351-1358 8 p. 7502606. (2016 International Conference on Unmanned Aircraft Systems, ICUAS 2016).

### **Indoor mapping using SLAM for applications in Flexible Manufacturing Systems**

Schueftan, D. S., Colorado, M. J. & Bernal, I. F. M., 02 dic. 2015, *2015 IEEE 2nd Colombian Conference on Automatic Control, CCAC 2015 - Conference Proceedings*. Osorio, G. A. (ed.). Institute of Electrical and Electronics Engineers Inc., 7345226. (2015 IEEE 2nd Colombian Conference on Automatic Control, CCAC 2015 - Conference Proceedings).

### **Geo-Mapping and Visual Stitching to Support Landmine Detection Using a Low-Cost UAV**

Colorado, J., Mondragon, I., Rodriguez, J. & Castiblanco, C., 15 sep. 2015, En: International Journal of Advanced Robotic Systems. 12, 9, 125.

### **Visual based navigation for power line inspection by using virtual environments**

Cerón, A., Mondragón, I. F. & Prieto, F., 2015, *Proceedings of SPIE-IS and T Electronic Imaging - Intelligent Robots and Computer Vision XXXII: Algorithms and Techniques*. Roning, J. & Casasent, D. (eds.). SPIE, 94060J. (Proceedings of SPIE - The International Society for Optical Engineering; vol. 9406).

#### **HMPMR strategy for real-time tracking in aerial images, using direct methods**

Martínez, C., Campoy, P., Mondragón, I. F., Sánchez-Lopez, J. L. & Olivares-Méndez, M. A., abr. 2014, En: *Machine Vision and Applications*. 25, 5, p. 1283-1308 26 p.

#### **A general purpose configurable controller for indoors and outdoors GPS-denied navigation for multirotor Unmanned Aerial Vehicles**

Pestana, J., Mellado-Bataller, I., Sanchez-Lopez, J. L., Fu, C., Mondragón, I. F. & Campoy, P., ene. 2014, En: *Journal of Intelligent and Robotic Systems: Theory and Applications*. 73, 1-4, p. 387-400 14 p.

#### **Air drones for explosive landmines detection**

Castiblanco, C., Rodriguez, J., Mondragon, I., Parra, C. & Colorado, J., 2014, *ROBOT2013: 1st Iberian Robotics Conference - Advances in Robotics*. Sanfeliu, A., Ferre, M., Armada, M. A. & Armada, M. A. (eds.). Springer Verlag, p. 107-114 8 p. (Advances in Intelligent Systems and Computing; vol. 253).

#### **Floor optical flow based navigation controller for multirotor aerial vehicles**

Pestana, J., Mellado-Bataller, I., Sanchez-Lopez, J. L., Fu, C., Mondragón, I. F. & Campoy, P., 2014, *ROBOT2013: 1st Iberian Robotics Conference - Advances in Robotics*. Sanfeliu, A., Ferre, M., Armada, M. A. & Armada, M. A. (eds.). Springer Verlag, p. 91-106 16 p. (Advances in Intelligent Systems and Computing; vol. 253).

#### **Low-cost quadrotor applied for visual detection of landmine-like objects**

Rodriguez, J., Castiblanco, C., Mondragon, I. & Colorado, J., 2014, *2014 International Conference on Unmanned Aircraft Systems, ICUAS 2014 - Conference Proceedings*. IEEE Computer Society, p. 83-88 6 p. 6842242. (2014 International Conference on Unmanned Aircraft Systems, ICUAS 2014 - Conference Proceedings).

#### **Power line detection using a circle based search with UAV images**

Ceron, A., Mondragon B., I. F. & Prieto, F., 2014, *2014 International Conference on Unmanned Aircraft Systems, ICUAS 2014 - Conference Proceedings*. IEEE Computer Society, p. 632-639 8 p. 6842307. (2014 International Conference on Unmanned Aircraft Systems, ICUAS 2014 - Conference Proceedings).

#### **Towards visual based navigation with power line detection**

Cerón, A., Mondragón B., I. F. & Prieto, F., 2014, *Advances in Visual Computing - 10th International Symposium, ISVC 2014, Proceedings*. Bebis, G., Boyle, R., Parvin, B., Koracin, D., McMahan, R., Jerald, J., Zhang, H., Drucker, S. M., Chandra, K., Maha, E. C., Deng, Z. & Carlson, M. (eds.). Springer Verlag, p. 827-836 10 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 8887).

#### **A hierarchical tracking strategy for vision-based applications on-board UAVs**

Martínez, C., Mondragón, I. F., Campoy, P., Sánchez-López, J. L. & Olivares-Méndez, M. A., dic. 2013, En: *Journal of Intelligent and Robotic Systems: Theory and Applications*. 72, 3-4, p. 517-539 23 p.

#### **A general purpose configurable navigation controller for micro aerial multirotor vehicles**

Pestana, J., Mellado-Bataller, I., Fu, C., Sanchez-Lopez, J. L., Mondragon, I. F. & Campoy, P., 2013, *2013 International Conference on Unmanned Aircraft Systems, ICUAS 2013 - Conference Proceedings*. p. 557-564 8 p. 6564733. (2013 International Conference on Unmanned Aircraft Systems, ICUAS 2013 - Conference Proceedings).

#### **Autonomous guided car using a fuzzy controller**

Olivares-Mendez, M. A., Campoy, P., Mellado-Bataller, I., Mondragon, I., Martinez, C. & Sanchez-Lopez, J. L., 2013, *Recent Advances in Robotics and Automation*. Sen Gupta, G., Bailey, D., Demidenko, S. & Carnegie, D. (eds.). p. 37-55 19 p. (Studies in Computational Intelligence; vol. 480).

#### **Autonomous landing of an unmanned aerial vehicle using image-based fuzzy control**

Olivares-Mendez, M. A., Mondragón, I. F. & Campoy, P., 2013, *2nd IFAC Workshop on Research, Education and Development of Unmanned Aerial Systems, RED-UAS 2013 - Proceedings*. PART 1 ed. IFAC Secretariat, p. 79-86 8 p. (IFAC Proceedings Volumes (IFAC-PapersOnline); vol. 2, N.º PART 1).

### **Vision based control for micro aerial vehicles: Application to sense and avoid**

Mejias, L., Mondragón Bernal, I. F. & Campoy, P., 2013, *Recent Advances in Robotics and Automation*. Sen Gupta, G., Bailey, D., Demidenko, S. & Carnegie, D. (eds.). p. 127-141 15 p. (Studies in Computational Intelligence; vol. 480).

### On-board and ground visual pose estimation techniques for UAV control

Martínez, C., Mondragón, I. F., Olivares-Méndez, M. A. & Campoy, P., ene. 2011, En: *Journal of Intelligent and Robotic Systems: Theory and Applications*. 61, 1-4, p. 301-320 20 p.

### 3D object following based on visual information for Unmanned Aerial Vehicles

Mondragón, I. F., Campoy, P., Olivares-Mendez, M. A. & Martinez, C., 2011, *2011 IEEE 9th Latin American Robotics Symposium and IEEE Colombian Conference on Automatic Control, LARC 2011 - Conference Proceedings*. 6086794. (2011 IEEE 9th Latin American Robotics Symposium and IEEE Colombian Conference on Automatic Control, LARC 2011 - Conference Proceedings).

### A visual AGV-urban car using Fuzzy control

Olivares-Mendez, M. A., Mellado, I., Campoy, P., Mondragon, I. & Martinez, C., 2011, *ICARA 2011 - Proceedings of the 5th International Conference on Automation, Robotics and Applications*. p. 145-150 6 p. 6144872. (ICARA 2011 - Proceedings of the 5th International Conference on Automation, Robotics and Applications).

### Unmanned aerial vehicles UAVs attitude, height, motion estimation and control using visual systems

Mondragón, I. F., Olivares-Méndez, M. A., Campoy, P., Martínez, C. & Mejias, L., jul. 2010, En: *Autonomous Robots*. 29, 1, p. 17-34 18 p.

### Omnidirectional vision applied to Unmanned Aerial Vehicles (UAVs) attitude and heading estimation

Mondragón, I. F., Campoy, P., Martinez, C. & Olivares, M., 30 jun. 2010, En: *Robotics and Autonomous Systems*. 58, 6, p. 809-819 11 p.

### 3D pose estimation based on planar object tracking for UAVs control

Mondragón, I. F., Campoy, P., Martínez, C. & Olivares-Méndez, M. A., 2010, *2010 IEEE International Conference on Robotics and Automation, ICRA 2010*. p. 35-41 7 p. 5509287. (Proceedings - IEEE International Conference on Robotics and Automation).

### Fuzzy controller for UAV-landing task using 3D-position visual estimation

Olivares-Méndez, M. A., Mondragón, I. F., Campoy, P. & Martínez, C., 2010, *2010 IEEE World Congress on Computational Intelligence, WCCI 2010*. 5584396. (2010 IEEE World Congress on Computational Intelligence, WCCI 2010).

### Non-symmetric membership function for fuzzy-based visual servoing onboard a UAV

Olivares-Méndez, M. A., Campoy, P., Martínez, C. & Mondragón B., I. F., 2010, *Computational Intelligence Foundations and Applications - Proceedings of the 9th International FLINS Conference, FLINS 2010*. Ruan, D., Kerre, E. E., Ruan, D., Chen, G., Li, T. & Xu, Y. (eds.). World Scientific Publishing Co. Pte Ltd, p. 300-307 8 p. (Computational Intelligence Foundations and Applications - Proceedings of the 9th International FLINS Conference, FLINS 2010).

### A pan-tilt camera Fuzzy vision controller on an unmanned aerial vehicle

Olivares-Méndez, M. A., Campoy, P., Martínez, C. & Mondragón, I., 11 dic. 2009, *2009 IEEE/RSJ International Conference on Intelligent Robots and Systems, IROS 2009*. p. 2879-2884 6 p. 5354576. (2009 IEEE/RSJ International Conference on Intelligent Robots and Systems, IROS 2009).

### Trinocular ground system to control UAVs

Martínez, C., Campoy, P., Mondragón, I. & Olivares-Méndez, M. A., 11 dic. 2009, *2009 IEEE/RSJ International Conference on Intelligent Robots and Systems, IROS 2009*. p. 3361-3367 7 p. 5354489. (2009 IEEE/RSJ International Conference on Intelligent Robots and Systems, IROS 2009).

### Visual 3-D SLAM from UAVs

Artieda, J., Sebastian, J. M., Campoy, P., Correa, J. F., Mondragón, I. F., Martínez, C. & Olivares, M., ago. 2009, En: *Journal of Intelligent and Robotic Systems: Theory and Applications*. 55, 4-5, p. 299-321 23 p.

Computer vision onboard UAVs for civilian tasks

Campoy, P., Correa, J. F., Mondragón, I., Martínez, C., Olivares, M., Mejías, L. & Artieda, J., mar. 2009, En: Journal of Intelligent and Robotic Systems: Theory and Applications. 54, 1-3 SPEC. ISS., p. 105-135 31 p.

Fuzzy control system navigation using priority areas

Olivares, M. A., Campoy, P., Martínez, C., Correa, J. F. & Mondragón, I., 2008, *World Scientific Proceedings Series on Computer Engineering and Information Science 1; Computational Intelligence in Decision and Control - Proceedings of the 8th International FLINS Conference*. World Scientific Publishing Co. Pte Ltd, p. 987-995 9 p. (World Scientific Proceedings Series on Computer Engineering and Information Science 1; Computational Intelligence in Decision and Control - Proceedings of the 8th International FLINS Conference).

COLIBRI: A vision-guided UAV for surveillance and visual inspection

Mejías, L., Correa, J. F., Mondragón, I. & Campoy, P., 2007, *2007 IEEE International Conference on Robotics and Automation, ICRA'07*. p. 2760-2761 2 p. 4209501. (Proceedings - IEEE International Conference on Robotics and Automation).

Stereo visual system for autonomous air vehicle navigation

Mejías, L., Campoy, P., Mondragón, I. & Doherty, P., 2007, *6th IFAC Symposium on Intelligent Autonomous Vehicles, IAV 200707 - Proceedings*. PART 1 ed. IFAC Secretariat, p. 203-208 6 p. (IFAC Proceedings Volumes (IFAC-PapersOnline); vol. 6, N.º PART 1).

Visual model feature tracking for UAV control

Mondragón, I. F., Campoy, P., Correa, J. F. & Mejías, L., 2007, *2007 IEEE International Symposium on Intelligent Signal Processing, WISP*. 4447629. (2007 IEEE International Symposium on Intelligent Signal Processing, WISP).

## Proyectos

### **Aerial Identification of Amazonian Palms in High-Density Forest Using Deep Learning**

Colorado Montaña, J. D. (Coinvestigador principal) & Mondragón Bernal, I. F. (Otro)  
04/05/22 → 03/11/22

### **Aerial identification of fruit maturity in Amazonian palms via plant-canopy modeling**

Colorado Montaña, J. D. (Coinvestigador principal) & Mondragón Bernal, I. F. (Otro)  
26/07/23 → 25/01/24

### **Assist-as-needed exoskeleton for hand joint rehabilitation based on muscle effort detection**

Colorado Montaña, J. D. (Coinvestigador), Mondragón Bernal, I. F. (Coinvestigador) & Alvarado Rojas, C. (Otro)  
21/06/21 → 20/12/21

### **ATLAS-PUJ: Inner Tracker environmental temperature monitoring system for ATLAS phase-II upgrade of CERN. Sistema de monitoreo de temperatura ambiental del detector interno para la fase II de la actualización del detector ATLAS del CERN**

Flórez Rubio, D. M. (Investigador principal), Bustacara Medina, C. J. (Coinvestigador), Díez Medina, R. F. (Coinvestigador), Gerlein Reyes, E. A. (Coinvestigador), Jiménez Borrego, L. C. (Coinvestigador), Mondragón Bernal, I. F. (Coinvestigador), Ojalora Sánchez, C. (Coinvestigador), Solans Sánchez, C. (Coinvestigador), Abay Gomez, J. E. (Estudiante), Manrique Suárez, A. J. (Estudiante), Rodríguez Ruiz, C. A. (Estudiante), Rodríguez Ochoa, S. (Estudiante), Simanca Tobio, A. D. (Estudiante), Vera Ortega, D. A. (Estudiante) & Vergara Alpizar, S. (Estudiante)  
01/07/24 → 31/12/25

### **De-MiBot: Robot aéreo para detección de minas explosivas en campos rurales.**

Colorado Montaña, J. D. (Investigador principal) & Mondragón Bernal, I. F. (Coinvestigador)  
20/01/14 → 19/07/14

### **Desarrollo de material didáctico para el estudio de la anatomía mediante el uso de modelos 3D imprimibles o virtualizables**

Cortes Barre, M. (Investigador principal), Florez Valencia, L. (Coinvestigador), Gutierrez Gomez, M. L. (Coinvestigador), Manrique Torres, M. (Coinvestigador) & Mondragón Bernal, I. F. (Coinvestigador)  
16/10/18 → 16/04/21

**Desarrollo de una herramienta para la agricultura de precisión en los cultivos de arroz: sensado del estado de crecimiento y de nutrición de las plantas usando un drone autónomo.**

Colorado Montaña, J. D. (Investigador principal), Cotrino Badillo, C. E. (Coinvestigador), Martínez Luna, C. V. (Coinvestigador), Mondragón Bernal, I. F. (Coinvestigador) & Patiño Guevara, D. A. (Coinvestigador)  
03/01/17 → 03/01/19

**Diseño e implementación de una arquitectura de un sistema ciber-físico de producción centrado en el humano (H-CPPS), que facilita la evolución de las pequeñas y medianas empresas manufactureras (Pymes) hacia la cuarta revolución industrial.**

Acosta Mejia, J. C. (Investigador principal), Aguirre Mayorga, H. S. (Coinvestigador), Alvarado Valencia, J. A. (Coinvestigador), Caro Gutierrez, M. P. (Coinvestigador), Gonzalez Neira, E. M. (Coinvestigador), Mondragón Bernal, I. F. (Coinvestigador), Saavedra Robinson, L. A. (Coinvestigador) & Zambrano Rey, G. M. (Coinvestigador)  
16/09/19 → 15/09/23

**Diseño y construcción de un sistema de control para la medición de la rugosidad en proceso de mecanizado**

Manrique Torres, M. (Investigador principal), Martínez Luna, C. V. (Coinvestigador) & Mondragón Bernal, I. F. (Coinvestigador principal)  
01/02/17 → 31/07/18

**Diseño y Fabricación de un exoesqueleto robótico para terapia articular.**

Colorado Montaña, J. D. (Investigador principal), Alvarado Rojas, C. (Coinvestigador principal) & Mondragón Bernal, I. F. (Coinvestigador principal)  
15/02/17 → 14/07/19

**Drones para Inspección de líneas eléctricas**

Parra Rodriguez, C. A. (Investigador principal), Martínez Luna, C. V. (Coinvestigador principal) & Mondragón Bernal, I. F. (Coinvestigador principal)  
10/06/19 → 01/07/24

**IREHAB: Sistema inteligente de Rehabilitación usando un Exoesqueleto robótico para recuperar Habilidad motora en discapacidades post-ACV, considerando señales Biológicas del paciente.**

Colorado Montaña, J. D. (Investigador principal), Irigorri Cucalon, A. M. (Coinvestigador), Mendez Chaves, D. (Coinvestigador), Mondragón Bernal, I. F. (Coinvestigador) & Alvarado Rojas, C. (Coinvestigador principal)  
28/11/22 → 27/11/25

**Modelado y simulación de un radar de penetración de tierra (GPR) para detección aérea de minas antipersona usando un Drone.**

Colorado Montaña, J. D. (Investigador principal), Mendez Chaves, D. (Coinvestigador), Mondragón Bernal, I. F. (Coinvestigador) & Perez Cerquera, M. R. (Coinvestigador)  
15/01/16 → 14/03/17

**Optimal deployment of WSN nodes for crop monitoring based on geostatistical interpolations**

Colorado Montaña, J. D. (Coinvestigador), Mondragón Bernal, I. F. (Coinvestigador) & Mendez Chaves, D. (Otro)  
03/08/22 → 02/02/23

**Optimized navigation control of an underwater fish-like robot applied to monitoring and inspection.**

Colorado Montaña, J. D. (Investigador principal), Mondragón Bernal, I. F. (Coinvestigador) & Patiño Guevara, D. A. (Coinvestigador)  
15/01/21 → 14/07/22

**P4: plataforma para Fenotipificación Multiescala de alta resolución para cultivos. programa: Omicas: Optimización Multiescala In-Silico de cultivos agrícolas sostenibles (infraestructura y validación en arroz y caña de azúcar).**

Colorado Montaña, J. D. (Investigador principal), Calderon Bocanegra, F. C. (Coinvestigador), Mendez Chaves, D. (Coinvestigador), Mondragón Bernal, I. F. (Coinvestigador), Narducci Marin, M. S. (Coinvestigador), Patiño Guevara, D. A.



(Coinvestigador) & Quiroga Sepulveda, J. A. (Coinvestigador)  
29/10/18 → 01/12/23

**Perception for Industrial Robots (PIR project)**

Mondragón Bernal, I. F. (Investigador principal), Manrique Torres, M. (Coinvestigador) & Quiroga Sepulveda, J. A. (Coinvestigador)  
01/02/18 → 29/05/20

**Robot aéreo aplicado a la detección autónoma de minas antipersona usando gpr y visión.**

Colorado Montaña, J. D. (Investigador principal), Mendez Chaves, D. (Coinvestigador), Mondragón Bernal, I. F. (Coinvestigador) & Perez Cerquera, M. R. (Coinvestigador)  
01/02/15 → 01/08/16

**Sistema de rehabilitación inteligente y progresivo para terapias de rehabilitación articular de la mano por medio de un exoesqueleto robótico.**

Alvarado Rojas, C. (Investigador principal), Colorado Montaña, J. D. (Coinvestigador), Mondragón Bernal, I. F. (Coinvestigador) & Espinosa, A. (Asesor)  
15/01/21 → 15/07/22

**Visión industrial inteligente: Aplicaciones a sistemas de manufactura flexible y vehiculos guiados autónomamente. AGVs.**

Mondragón Bernal, I. F. (Investigador principal), Colorado Montaña, J. D. (Coinvestigador), Gonzalez Bautista, S. R. (Coinvestigador) & Manrique Torres, M. (Coinvestigador)  
27/01/14 → 26/09/15