

# Isidro Gómez Vargas

PhD candidate

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Mexico city, 1989

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## Education

- 2017– today **PhD student**, *Advanced Technology*, CICATA-Legaria, IPN, México city (in 2019-2020 as an associate student of ICF-UNAM), Thesis: *Bayesian inference and function reconstruction with artificial neural networks*.  
Supervisors: PhD. Ricardo García Salcedo and PhD. José Alberto Vázquez González.
- 2015 **Master**, *Advanced Technology*, CICATA-Legaria, IPN, Thesis: *Design and development of an Augmented Reality mobile app for the teaching of geometry*.  
Supervisors: PhD. Ricardo García Salcedo and PhD. Daniel Sánchez Guzmán.
- 2013 **Bachelor**, *Physics and mathematics*, ESFM, IPN, México city, Thesis: *Operational Tracking of a Fuel Recharge of a BWR with SIMULATE-3*.  
Supervisor: PhD. Edmundo del Valle Gallegos.

## Research Stays

- 2020 **Reversible nested sampling**, *Remote collaboration due to the COVID-19 pandemic*, Cambridge University, UK.  
Supervisor: Dr. Will Handley
- 2019 **Parameter estimation in observational cosmology with SimpleMC**, ICF-UNAM, Cuernavaca, Morelos, México.  
Supervisor: PhD. José Alberto Vázquez González.
- 2018 **Estimation of cosmological parameters with CosmoSIS codes**, IFM, UMSNH, Morelia, Michoacán, México.  
Supervisor: PhD. Ulises Nucamendi Gómez.
- 2016 **Intelligent Tutors Agents for the Improvement of Cognitive and Behavioural Processes of University Students, in Support of the Increase in the Student Approval and Retention Index**, *Department of Information and Visualization Technologies of UABC-Ensenada*, Ensenada, Baja California, México.  
Supervisors: PhD. Omar Alvarez Xochihua and MSc. Sergio O. Infante Prieto.

## Courses, workshops and certifications

- 2019 **Data-driven Astronomy**, *online non-credit course authorized by The University of Sydney and offered through Coursera*.
- 2019 **IV School of Evolutionary Computing**, CIMAT, Guanajuato, México.
- 2017 **Diplomat**, *Knowledge Discovery with Big Data tools*, CIC, IPN, México city, 124 hours.
- 2017 **Python programming with applications in the scientific field**, CIC, IPN, México city, 35 hours.
- 2016 **Basic Java**, CIC, IPN, México city, 35 hours.

## Publications

### Papers and proceedings in indexed journals as first author

- 2019 Gómez Vargas, I., Medel Esquivel, R., García Salcedo, R. & J. A. Vázquez, **Una Aplicación de las Redes Neuronales en Cosmología**, *Komputer Sapiens*, 2(11), 12-17.
- 2019 Gómez-Vargas, I., Medel-Esquivel, R., & García-Salcedo, R., **Cosmic voids, spatial algorithms and data structures.**, In *Journal of Physics: Conference Series* (Vol. 1221, No. 1, p. 012031). IOP Publishing.
- 2018 Gómez Vargas, I., Medel Esquivel, R. & García Salcedo, R., **Realidad Aumentada como herramienta didáctica en geometría 3D**, *Latin-American Journal of Physics Education.*, 12(4), 3.

## Papers and proceedings in indexed journals as a collaborator

- 2021 Medel Esquivel, R., Gómez Vargas, I., Vázquez, J.A., & García Salcedo, R., **An introduction to Markov Chain Monte Carlo**, Boletín de Estadística e Investigación Operativa, Accepted in No. 37 year 2021.
- 2019 Medel-Esquivel, R., Gómez-Vargas, I., Rivera-Moltalvo, T., & Salcedo, R. G., **Cosmological evolution for magnetic universe based in a simple nonlinear electrodynamics.**, In Journal of Physics: Conference Series (Vol. 1221, No. 1, p. 012038). IOP Publishing.

## Other

- 2019 Medel Esquivel, García Salcedo, R. & Gómez Vargas, I., **Textbook Matemáticas III Travesías**, Ed. Castillo., ISBN: 978-607-540-522-3.
- 2017 Gómez Vargas, Isidro, **Didactic possibility of Augmented Reality**, Sólo ensayo. Antología de Jóvenes escritores Vol. 2. IPN. ISBN: 978-607- 8085-13-2.

## Work Experience

- 2016-2018 **Collaborator and technical reviewer**, *Castillo editions, SM editorial, Edimend, Quipper, Khan academy*, Physics and mathematics, High School.
- 2013-2014 **Teacher**, *CECyT 8, IPN*, Professor on high school of mathematics and physics.

## Awards and grants

- 2015- 2020 **CONACYT grant**, quality Mexican postgraduate programs.
- 2017-2020 **BEIFI-IPN grant**, *proyectos 20190237, 2018252, 20172234, 20170322*, Data mining and statistical algorithms applied in physics.
- 2018 **Technological Development or Innovation Projects for IPN students 2018**, *SIP-IPN*, \$2,500.00 USD.
- 2017 **2nd place**, *XIX International Christmas, Sudden, Brief and Electronic Story Contest*, Ficticia editorial.
- 2016 **2nd place**, *Educational Innovation Essay Award*, graduate category, essay "Augmented Reality for an education". IPN, \$500.00 USD.

## Workshops or talks given

- 2020 **Workshop: Cosmology with SimpleMC 2.0**, *from June 3rd to 5th. Theoretical and computational physics group, ICF, UNAM, Cuernavaca, México.*
- 2019 **Nested sampling, neural networks and SimpleMC**, *seminar of gravitation and cosmology, ICF, UNAM, Cuernavaca, México.*
- 2019 **Short talk about neural networks in cosmological parameter estimation**, *3a. Mexican Astro-CosmoStatistics School*, Physics department, Guanajuato University.
- 2018 **Data science algorithms for cosmic voids**, *National School of Cosmology, Engineering Division, Universidad de Guanajuato.*
- 2017 **Augmented Reality as a didactic tool in 3D geometry**, *LASERA conference 2017, Latin American Association of Research in Science Education.*

## Poster presentations

- 2019 **Artificial Neural Networks as optimizers in Bayesian inference**, *Joint workshop on Deep Learning, Data Science, CIMAT-INAOE, CIMAT, Guanajuato, Mexico.*
- 2019 **State of the art in the application of Artificial Neural Networks in diagnostic radiology**, *XIX International Symposium on Solid State Dosimetry, Zacatecas, México.*
- 2018 **Cosmic voids, spatial algorithms and data structures**, *IX International Congress of Engineering Physics, UAM, Mexico city, Mexico.*

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## Skills

Programming: Python, SQL. Intermediate: R, C, C#, Java

OS: Windows, Linux.

Languages: native Spanish, intermediate English.

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## Contact links

ResearchGate: [www.researchgate.net/profile/Isidro\\_Gomez-Vargas2](http://www.researchgate.net/profile/Isidro_Gomez-Vargas2)

LinkedIn: [www.linkedin.com/in/isidro-gomez-vargas/](http://www.linkedin.com/in/isidro-gomez-vargas/)

GitHub <https://github.com/igomezv/>

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## References

Dr. Ricardo García Salcedo: [rigarcias@ipn.mx](mailto:rigarcias@ipn.mx)

Dr. José Alberto Vázquez González: [javazquez@icf.unam.mx](mailto:javazquez@icf.unam.mx)