

VANDERLEI VARGAS JR.

Ph.D. in Atmospheric Science

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open to relocation

TECHNICAL SKILLS

Programming Languages:	Python, R, Fortran, Shell, NCL and GrADS.
Cloud Computing and High-Performance Environments:	Google Cloud Platform and Microsoft Azure; Experience handling large databases, SQL, CUDA Fortran (GPU), MPI and OpenMP.
Web Development:	Django, JavaScript, HTML, CSS and PHP.
Additional:	Docker, WRF, GSI, HPC System (Cheyenne - CISL/UCAR), Machine Learning, GitHub, Object-oriented programming (OOP).

EDUCATION

Ph.D. , Atmospheric Science, National Institute for Space Research (INPE), Brazil	Oct 2019
M.S. , Atmospheric Science, National Institute for Space Research (INPE), Brazil	Aug 2015
B.S. , Meteorology, Federal University of Pelotas (UFPEL), Brazil	Sep 2013

EXPERIENCE

Colorado State University / Cooperative Institute for Research in the Atmosphere (CSU/CIRA), *GDOC Algorithm Integration Specialist – Research Associate* Mar 2022 – Present

- Working on the NASA-funded project GeoCarb.
- Responsible for developing/managing algorithms for reception, processing, and distribution of satellite data.
- Full-Stack Developer

Meteomatics AG (Switzerland based), *Software and Data Assimilation Specialist* Jan 2020 – Feb 2022

- **Cloud Computing:** Leading a team in a large project aiming to develop research on the performance of a meteorological model on a cloud server. In charge to deploy virtual machines, install libraries, configure the communication between hosts, enable file sharing systems, and additional components necessary in the configuration of a computer cluster.
- **Software Development:** Working on the implementation of new components for weather forecasting to not only improve its accuracy, but also to increase the performance of the whole system, reducing costs and maximizing efficiency. This process includes the implementation of assimilation systems in order to ingest data from different sources (ground stations, satellites, radars...) and the improvement of algorithms.
- **Weather Forecasting:** Responsible for maintaining (correcting instabilities in the systems), evaluating (applying statistical methodologies and data analysis), and improving a high-resolution model.

Colorado State University / Cooperative Institute for Research in the Atmosphere (CSU/CIRA), *Visiting Scholar* Aug 2018 – Feb 2019

- **Lightning Assimilation System (LAS):** Developed a code in Fortran to assimilate lightning data in the WRF model and improved the Short-term Weather Forecasting.
- **Gridpoint Statistical Interpolation (GSI) improvements:** Implemented corrections and adaptations to the GSI code in order to assimilate Lightning data for regional applications.

National Oceanic and Atmospheric Administration / Earth System Research Laboratory / Global Observing Systems Analysis Group (NOAA/ESRL/GOSA), *Visiting Scholar* Aug – Sep 2017

- Contributed to international collaboration in the field of Lightning Data Assimilation.

Lightning Monitoring and Warning Center, *System Analyst and Weather Forecaster* Oct 2016 – Jul 2018

- Full-Stack Developer – Developed an internal **Web Page** with multiple systems to help the meteorological operation. Developed both, the **Client** (HTML, CSS, and JavaScript) and the **Server** (PHP and SQL).
- Managed and reconfigured the databases with the size of Terabytes.
- Provided **Installation, Configuration, and Maintenance** for **Weather Research and Forecasting (WRF)** operational model.
- **Automatic Report Generator:** Developed a system that creates a file containing all the information about the alerts sent to the monitored companies.
- **Real-Time Automatic Alert/Warning System:** The web page shows real-time data for high lightning risk locations. The risk is estimated from real-time lightning detections.

- Created Python scripts to generate meteorological products to help the meteorologists elaborate synoptic charts and predict the weather.
- Monitored and sent weather forecasting and meteorological reports to the customers.

Federal University of São Paulo (UNIFESP), *Graduate Teaching Assistant* Mar – Aug 2016

- Differential and Integral Calculus.

National Institute for Space Research (INPE), *Graduate Research Assistant* Jan – Aug 2015

- Started the research on Lightning Data Assimilation in Brazil.

Federal University of Pelotas (UFPEL), *Undergraduate Teaching Assistant* May 2012 – Mar 2013

- Physical Meteorology (Atmospheric Thermodynamics).

National Institute for Space Research (INPE), *Research Scientist Intern* Aug – Sep 2012

- Implemented assimilation of conventional data using the [WRF Data Assimilation \(WRFDA\)](#) system (variational tridimensional assimilation – [3DVAR](#)).
- For the first time, the Atmospheric Electricity Group (ELAT) started to develop research on Data Assimilation.

Federal University of Pelotas (UFPEL), *Undergraduate Research Assistant* Jan 2011 – Jul 2012

- Identified physical and morphological characteristics of the Severe Weather Events associated with Mesoscale Convective Systems (MCS) which helped to understand the occurrence of these phenomena in the south of Brazil.

PUBLICATIONS

JOURNALS

- J1. **VARGAS JR., V. R.**; CAMPOS, C. R. J. Eventos Severos no Rio Grande do Sul no Período 2004-2008 (**Severe Weather Events in the state of Rio Grande do Sul from 2004 to 2008**). Anuário do Instituto de Geociências, v. 38, p. 137-146, 2015.

PEER REVIEWED CONFERENCES

- C1 **VARGAS JR., V. R.**; ZEPKA, G. S.; AZAMBUJA, R. R.; PINTO JR., O. Study of the Correlation Between WRF Output Variables and Lightning Activity in Southeastern Brazil. In: 23rd International Lightning Detection Conference/International Lightning Meteorology Conference, 2014, Tucson, Arizona, USA. 23rd International Lightning Detection Conference/International Lightning Meteorology Conference, 2014.
- C2 ZEPKA, G. S.; AZAMBUJA, R. R.; **VARGAS JR., V. R.**; SCHILD, G. T.; PINTO JR., O. Predicting Lightning, Heavy Precipitation and Damaging Winds for a Mesoscale Convective System Case over Southern Brazil. In: 23rd International Lightning Detection Conference/International Lightning Meteorology Conference, 2014, Tucson, Arizona, USA. 23rd International Lightning Detection Conference/International Lightning Meteorology Conference, 2014.
- C3 AZAMBUJA, R. R.; ZEPKA, G. S.; **VARGAS JR., V. R.**; PINTO JR., O. Lightning Activity in Mesoscale Convective System Associated with Different Synoptic Situations over Southern South America. In: 23rd International Lightning Detection Conference/International Lightning Meteorology Conference, 2014, Tucson, Arizona, USA. 23rd International Lightning Detection Conference/International Lightning Meteorology Conference, 2014.
- C4 **VARGAS JR., V. R.**; AZAMBUJA, R; PINTO JR., O; HERDIES, D. L. Impacto da Assimilação de Dados de Superfície e de Ar Superior no Modelo WRF (**Impact of the Surface and Upper Air Data Assimilation in the WRF Model**). In: XIX Congresso Brasileiro de Meteorologia, 2016, João Pessoa. XIX Congresso Brasileiro de Meteorologia, 2016.
- C5 AZAMBUJA, R. R.; SANTOS, A. P. P.; **VARGAS JR., V. R.**; ZEPKA, G. S.; PINTO JR., O. Variabilidade Diária da Atividade de Relâmpagos na Região Sul do Brasil (**Daily Variation in Lightning Activity in Southern Brazil**). In: XIX Congresso Brasileiro de Meteorologia, 2016, João Pessoa, PB. XIX Congresso Brasileiro de Meteorologia, 2016.

- C6 **VARGAS JR., V. R.**; CAMPOS, C. R. J.; RASERA, G.; EICHHOLZ, C. W. Características Físicas dos CCM que Afetaram o RS no Período de 2004 a 2008 (**Physical Characteristics of the MCC that Affected the State of RS from 2004 to 2008**). In: XI Congresso Argentino de Meteorologia, 2012, Mendoza. XI Congresso Argentino de Meteorologia, 2012.
- C7 **VARGAS JR., V. R.**; MACEDO, L. R.; TUCHTENHAGEN, P. N.; YAMAZAKI, Y. Análise da Precipitação Acumulada no RS Utilizando o Modelo Numérico WRF (**Accumulated Precipitation Analysis in the State of RS Using the WRF Numerical Model**). In: XI Congresso Argentino de Meteorologia, 2012, Mendoza. XI Congresso Argentino de Meteorologia, 2012.
- C8 **VARGAS JR., V. R.**; CAMPOS, C. R. J.; RASERA, G.; EICHHOLZ, C. W. Formação e Deslocamento dos CCM que Afetaram o RS entre 2004 e 2008 (**Formation and Displacement of the MCCs that Affected the State of RS Between 2004 and 2008**). In: XI Congresso Argentino de Meteorologia, 2012, Mendoza. XI Congresso Argentino de Meteorologia, 2012.
- C9 **VARGAS JR., V. R.**; ARAÚJO, R. M.; TEIXEIRA, M. S. Avaliação das Condições de Vento Sobre o Aeroporto Internacional de Pelotas/RS de 2006 a 2010 (**Evaluation of the Wind Conditions over Pelotas International Airport from 2006 to 2010**). In: XI Congresso Argentino de Meteorologia, 2012, Mendoza. XI Congresso Argentino de Meteorologia, 2012.
- C10 **VARGAS JR., V. R.**; CAMPOS, C. R. J.; RASERA, G.; EICHHOLZ, C. W. Ambiente Sinótico de um CCM Ocorrido entre os dias 10 e 11 de Janeiro de 2006 no RS (**Synoptic Environment of the MCC over the State of RS on January 10 and 11, 2006**). In: XVII Congresso Brasileiro de Meteorologia, 2012, Gramado. XVII Congresso Brasileiro de Meteorologia, 2012.
- C11 **VARGAS JR., V. R.**; NUNES, M. D.; FOSTER, P. R. Estudo Da Variabilidade Da Refração Após A Passagem de um CCM sobre Rio Grande Do Sul (**Study of the Refraction Variability After the Occurrence of a MCC in the State of Rio Grande do Sul**). In: XVII Congresso Brasileiro de Meteorologia, 2012, Gramado. XVII Congresso Brasileiro de Meteorologia, 2012.
- C12 **VARGAS JR., V. R.**; NUNES, M. D.; PINTO, L. B. Estudo do Comportamento da Precipitação de um Ciclone Extratropical que Afetou o Rio Grande do Sul (**Study of the Precipitation Associated with an Extratropical Cyclone that Affected the state of Rio Grande do Sul**). In: XVII Congresso Brasileiro de Meteorologia, 2012, Gramado. XVII Congresso Brasileiro de Meteorologia, 2012.
- C13 **VARGAS JR., V. R.**; NUNES, M. D.; PINTO, L. B. Estudo do Ambiente Sinótico Associado a um Ciclone Extratropical que Afetou o Rio Grande do Sul (**Study of the Synoptic Environment Associated with an Extratropical Cyclone that Affected the State of Rio Grande do Sul**). In: XVII Congresso Brasileiro de Meteorologia, 2012, Gramado. XVII Congresso Brasileiro de Meteorologia, 2012.
- C14 NUNES, M. D.; **VARGAS JR., V. R.**; FOSTER, P. R. Análise e Monitoramento de Tempestade Através de Sensoriamento Remoto Ocorrida na Cidade de Pelotas-RS (**Analysis and Monitoring of a Storm Using Remote Sensing Data in Pelotas, RS**). In: XVII Congresso Brasileiro de Meteorologia, 2012, Gramado. XVII Congresso Brasileiro de Meteorologia, 2012.
- C15 NUNES, M. D.; **VARGAS JR., V. R.**; NUNES, A. B. Análise das Máximas Mensais de Insolação na Superfície da Cidade de Porto Alegre no ano de 2011 (**Analysis of the Maximum Monthly Insolation on the Surface of Porto Alegre City in 2011**). In: XVII Congresso Brasileiro de Meteorologia, 2012, Gramado. XVII Congresso Brasileiro de Meteorologia, 2012.
- C16 NUNES, M. D.; **VARGAS JR., V. R.**; PINTO, L. B. Análise do Balanço Hídrico Climatológico para o estado do Rio Grande do Sul (**Climatological Water Balance Analysis for the State of Rio Grande do Sul**). In: XVII Congresso Brasileiro de Meteorologia, 2012, Gramado. XVII Congresso Brasileiro de Meteorologia, 2012.
- C17 RASERA, G.; CAMPOS, C. R. J.; EICHHOLZ, C. W.; **VARGAS JR., V. R.** Precipitação Associada à SCM que Afetaram o Rio Grande do Sul em OND de 2006 (**Precipitation Associated with the MCSs that Affected the State of Rio Grande Do Sul In Oct-Nov-Dec 2006**). In: VIII Convención Internacional sobre Medio ambiente y desarrollo, 2011, Habana. VIII Convención Internacional sobre Medio ambiente y desarrollo, 2011.

PEER REVIEWED WORKSHOPS

- W1 VARGAS JR., V. R.; CAMPOS, C. R. J.; RASERA, G.; EICHHOLZ, C. W. Análise de Eventos Severos que Afetaram O RS no Período de 2004 a 2008 (**Analysis of the Severe Weather Events that Affected the State of RS from 2004 to 2008**). In: VII Brazilian Micrometeorology Workshop, 2011, Santa Maria. Anais do VII Workshop Brasileiro de Micrometeorologia, 2011.
- W2 RASERA, G.; CAMPOS, C. R. J.; VARGAS JR., V. R. Eventos de Vendaval que Afetaram o RS entre 2004 e 2008 (**Gale Events that Affected the State of RS between 2004 and 2008**). In: VII Brazilian Micrometeorology Workshop, 2011, Santa Maria. Anais do VII Workshop Brasileiro de Micrometeorologia, 2011.

POSTERS

- P1 VARGAS JR., V. R.; HERDIES, D. L.; PINTO JR., O.; APODACA, K. A Review Study of the Application of Data Assimilation Methods for the Incorporation of Lightning Data into NWP Models. In: Seventh International WMO Symposium on Data Assimilation, 2017, Florianópolis. Seventh International WMO Symposium on Data Assimilation, 2017.
- P2 BRAZ, D. F.; VARGAS JR., V. R.; PINTO, L. B.; CAMPOS, C. R. J. Distribuição Regional do Granizo no RS para o Período de 2003- 2012 (**Regional Distribution of Hail in the State of RS from 2003 to 2012**). In: XV Encontro de Pós-Graduação, 2013, Pelotas. XV Encontro de Pós-Graduação, 2013.
- P3 VARGAS JR., V. R.; CAMPOS, C. R. J.; RASERA, G.; EICHHOLZ, C. W. Estudo do Comportamento Morfológico e Radiativo de um CCM Ocorrido Sobre o Rio Grande do Sul (**Study of the Morphological and Radioactive Behavior of the MCC that Occurred in the State of RS**). In: XXI Congresso de Iniciação Científica, 2012, Pelotas. XXI Congresso de Iniciação Científica, 2012.
- P4 VARGAS JR., V. R.; BRAZ, D. F.; SMICH, M. R.; SUAZO, G. R. C. EDO Lineares de Segunda Ordem Não Homogêneos (**Second Order Linear Non-Homogeneous Ordinary Differential Equation**). In: XXI Congresso de Iniciação Científica, 2012, Pelotas. XXI Congresso de Iniciação Científica, 2012.
- P5 ARAUJO, R. C.; VERONEZ, F. B.; VARGAS JR., V. R.; SMICH, M. R.; SUAZO, G. R. C. A Função W de Lambert e Aplicações na Física (**The Lambert W Function and its Applications**). In: XXI Congresso de Iniciação Científica, 2012, Pelotas. XXI Congresso de Iniciação Científica, 2012.
- P6 VERONEZ, F. B.; ARAUJO, R. C.; VARGAS JR., V. R.; SUAZO, G. R. C.; SMICH, M. R. As Noções de Cálculo sob o Ponto de Vista de Sistemas com Auxílio do Simulink (**Calculus Using Systems in Simulink**). In: XXI Congresso de Iniciação Científica, 2012, Pelotas. XXI Congresso de Iniciação Científica, 2012.
- P7 VARGAS JR., V. R.; CAMPOS, C. R. J.; EICHHOLZ, C. W.; RASERA, G. Precipitação Associada à SCM que Afetaram o RS em AMJ de 2006 (**Precipitation Associated with the MCS that Affected the State of RS in Apr-May-Jun 2006**). In: IV Encontro Sul-Brasileiro de Meteorologia, 2011, Pelotas. A atmosfera e sua influência na sociedade, 2011.
- P8 VARGAS JR., V. R.; ARAÚJO, R. M.; NALERIO, N.; TEIXEIRA, M. S. Avaliação das Condições de Vento Sobre o Aeroporto Internacional de Pelotas/RS em 2010 (**Evaluation of the Wind Conditions over Pelotas International Airport in 2010**). In: XX Congresso de Iniciação Científica, 2011, Pelotas. XX Congresso de Iniciação Científica, 2011.
- P9 VARGAS JR., V. R.; RASERA, G.; EICHHOLZ, C. W.; CAMPOS, C. R. J. Análise da Ocorrência de Granizo no RS de 2004 a 2008 (**Analysis of the Occurrence of Hail in the State of RS from 2004 to 2008**). In: XX Congresso de Iniciação Científica, 2011, Pelotas. XX Congresso de Iniciação Científica, 2011.
- P10 VARGAS JR., V. R.; SOUZA, T. R.; IACKS, J. A.; SMICH, M. R. Abordagem Analítica, Qualitativa e Numérica da Absorção ou Transmissão de Radiação, por Meio De CAS (Sistemas De Computação Algébrica) (**Analytical, Qualitative and Numerical Approaches for The Radiation Absorption or Transmission Using CAS (Computational Algebraic System)**). In: XX Congresso de Iniciação Científica, 2011, Pelotas. XX Congresso de Iniciação Científica, 2011.

P11 SOUZA, T. R.; IACKS, J. A.; **VARGAS JR., V. R.**; SMICH, M. R. Resolução Numérica de Equações Diferenciais de Segunda Ordem pelo Método de Taylor (**Numerical Solution for the Second Order Differential Equations Using the Taylor Method**). In: XX Congresso de Iniciação Científica, 2011, Pelotas. XX Congresso de Iniciação Científica, 2011.

P12 IACKS, J. A.; SOUZA, T. R.; **VARGAS JR., V. R.**; SMICH, M. R. Utilização de CAS (Sistemas De Computação Algébrica) para Otimização de uso de Materiais na Engenharia (**Application of CAS (Computational Algebraic System) for Optimizing the use of Materials in Engineering**). In: XX Congresso de Iniciação Científica, 2011, Pelotas. XX Congresso de Iniciação Científica, 2011.

HONORS & AWARDS

CAPES scholarship, 2018 – 2019

Awarded with an exchange program scholarship.

RIKEN travel award, 2018

Awarded to attend the RIKEN International School on Data Assimilation (RISDA) in Japan.

World Meteorological Organization (WMO) travel award, 2017

Awarded to attend the Seventh International WMO Symposium on Data Assimilation in Brazil.

Honorable Mention, 2013

First of the class in the Meteorology course.

INPE scholarship, 2012

Awarded with an internship program.

Scientific Initiation scholarship, 2011 – 2012

Only undergraduate student awarded with this category of scholarship.

Awarded in the IV Encontro Sul-Brasileiro de Meteorologia Conference, 2011

Second place in the weather forecast contest.