
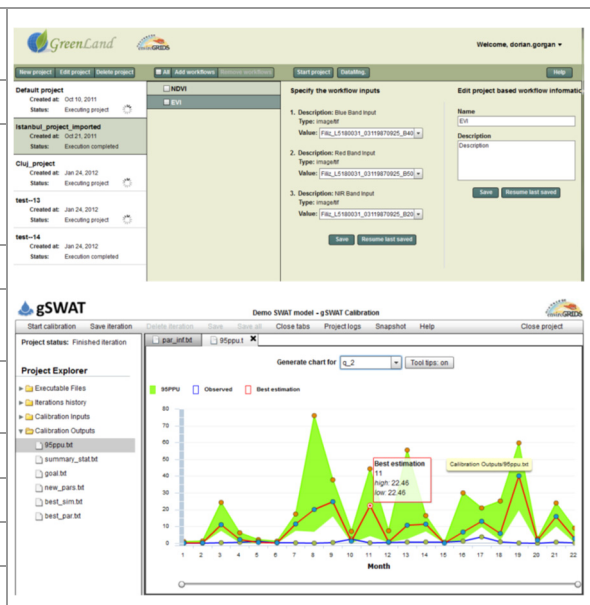


COMPUTER GRAPHICS AND INTERACTIVE SYSTEMS LABORATORY

Contact details

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Areas of expertise

High performance graphical processing and visualization, parallel and distributed processing over HPC infrastructures such as Grid, Cloud, GPU clusters, interoperability of HPC platforms, interactive application development, development of platforms and applications for spatial data processing and visualization, interdisciplinary research in the domains of Earth Sciences and Earth Observations.

Team

Prof.Dr.Eng. Dorian Gorgan, Assoc.Prof.Dr.Eng. Victor Băcu, Assoc.Prof.Dr.Eng. Teodor Ștefănuț, Assoc.Prof.Dr.Eng. Cornelia Melenti, Assoc.Prof.Dr.Eng. Mihaela Ordean, Assist.Prof.Dr.Eng. Adrian Sabou, Dr.Eng. Danut Mion, Dr.Eng. Cristian Mocan, Eng. Denisa Rodila, Eng. Vlad Colceriu, Eng. Constantin Nandra, Eng. Mihai Bica, Eng. Marius Gorgan, Eng. Denisa Copandean

Representative projects

NEARBY – “Visual Analysis of Multidimensional Astrophysics Data for Moving Objects Detection”, STAR 2017, (2017-2019) <http://cgis.utcluj.ro/nearby>
HORUS – “Software Toolbox for Pedological Monitoring of Transylvanian Area based on Sentinel-2 Data”, STAR 2017, (2017-2019) <http://cgis.utcluj.ro/horus/>
BIGEARTH - Flexible processing of big earth data over high performance computing architectures, ROSA STAR project (2013-2016), <http://cgis.utcluj.ro/projects/bigeearth>.
PECSA - Experimental Computer Services Platform for Scientific and Entrepreneurial Development, PN-II-PT-PCCA proiect (2014-2017), <http://cgis.utcluj.ro/pecsa>.
IASON - Fostering sustainability and uptake of research results through Networking activities in Black Sea & Mediterranean areas, FP7 project, funded by the European Commission (2013 - 2015), <http://www.iason-fp7.eu/>.
EnviroGRIDS - Building Capacity for a Black Sea Basin Observation and Assessment System supporting Sustainable Development. FP7 project, funded by the European Commission (2009 - 2013), <http://www.envirogrids.net/>.
SEE-GRID-SCI - SEE-GRID infrastructure for regional eScience. FP7 project, funded by the European Commission (2008 - 2010), <http://www.see-grid-sci.eu/>.
KEYSTONE - Semantic keyword-based search on structured data sources, COST Action IC1302 (2013-2017), <http://www.keystone-cost.eu/keystone/>.
ComplexHPC - Open European Network for High-Performance Computing in Complex Environments, COST Action IC0805 (2009-2013), <http://complexhpc.org/>
mEducator - Multi-type Content Repurposing and Sharing in Medical Education. eContentplus - Digital Content and Cognitive Systems Programme funded by European Commission (2009-2012), <http://www.meducator.net/>.
GISHEO – On demand Grid services for high education and training in Earth observation. Funded by European Space Agency through PECS Programme (2008-2010), <http://gisheo.info.uvt.ro/>.

Significant results

The most representative publications of the past 5 years:

1. Copandean, Denisa; Nandra, Constantin; Gorgan, Dorian; et al., Asteroids Detection Tehnique: Classic "Blink" An Automated Approach Conference: 21st IEEE International Conference on Automation, Quality and Testing, Robotics (AQTR THETA) Location: Cluj Napoca, ROMANIA Date: MAY 24-26, 2018
2. Bica M, Gorgan D., Data Locality Aware Algorithm for Task Execution on Distributed, Cloud Based Environments, 11th International Conference on Complex, Intelligent, and Software Intensive Systems (CISIS) Location: Ist Superiore Mario Boella, Torino, ITALY Date: JUL 10-12, 2017, COMPLEX, INTELLIGENT, AND SOFTWARE INTENSIVE SYSTEMS, CISIS-2017 Book Series: Advances in Intelligent Systems and Computing, Volume: 611, Pp: 557-566, 2018
3. V. D. Colceriu, T. Stefanut, V. Bacu, and D. Gorgan, "Annotation and Position Recall from Low Grade Sensorial Data in the Context of Topological Railway Maps," Studies in Informatics and Control, vol. 26, no. 4, pp. 469-480, Dec 2017.
4. V. Bacu, C. Nandra, T. Stefanut, and D. Gorgan, "SWAT model calibration over Cloud infrastructures using the BigEarth platform," in 2017 13th IEEE International Conference on Intelligent Computer Communication and Processing, R. Potolea and R. R. Slavescu, Eds. (IEEE International Conference on Intelligent Computer Communication and Processing ICCP, New York: IEEE, 2017, pp. 453-460.
5. D. Copandean, O. Vaduvescu, and D. Gorgan, "Automated Prototype for Asteroids Detection," in 2017 13th IEEE International Conference on Intelligent Computer Communication and Processing, R. Potolea and R. R. Slavescu, Eds. (IEEE International Conference on Intelligent Computer Communication and Processing ICCP, New York: IEEE, 2017, pp. 377-382.
6. P. Mazzetti, R. Roncella, D. Mihon, V. Bacu, P. Lacroix, Y. Guigoz, et al., "Integration of data and computing infrastructures for earth science: an image mosaicking use-case," *Earth Science Informatics*, vol. 9, pp. 325-342, Sep 2016.
7. Gorgan D., "Flexible and Adaptive Processing of Earth Observation Data over HPC Architectures", *International Conference on Satellite*, 17-19 Aug, Houston, pp.35, 2015.
8. Rodila D.D., Ray N., Gorgan D., "Conceptual Model for Environmental Science Applications on Parallel and Distributed Infrastructures", *Journal of Environmental Systems Research*, 4:23, 2015.
9. Bacu V., Stefanut T., Gorgan D., "Adaptive Processing of Earth Observation Data on Cloud Infrastructures Based on Workflow Description", *Proceedings of the Intelligent Computer Communication and Processing (ICCP)*, IEEE-Press, pp.449-454, (2015).
10. Gorgan D., Giuliani G., Ray N., Cau P., Abbaspour K., Charvat K., Jonoski A., Lehmann A., "Black Sea Catchment Observation System as a Portal for GEOSS Community", in *International Journal of Advanced Computer Science and Applications (IJACSA)*, pp.9-18, (2013).

Software tools and platforms developed by CGIS Laboratory:

BIGEARTH - platform to support the flexible description and adaptive processing of massive data over distributed HPC infrastructures.

WorDeL – workflow oriented language for flexible description of parallel and distributed processes.

gSWAT - gSWAT - platform and application allows the user to calibrate and execute the SWAT hydrological models in a flexible and interactive manner by taking advantage of the Grid infrastructure.

gSWATSim – is a collection of Web services supporting the Grid based calibration and execution of the SWAT hydrological models. It provides the SWAT related basic functionality required to develop a remote Web application.

GreenLand – is a platform and application for Grid based satellite image processing and visualization. The processing is described by an interactive graphical editor. The application is connected by standard geospatial services to spatial data repositories.

ESIP – Grid based satellite image processing platform. GreenLand is layered on ESIP and gProcess.

gProcess – Grid oriented task management and execution platform. gProcess is the basic platform for ESIP, GreenLand, and gSWAT.

eGLE – eLearning Platform for Earth Science domain. It supports the development and execution of teaching materials including Grid based processing of satellite images, and connectivity by geospatial Web services.

GreenView – supports the refinement of surface and vegetation parameters in South East Europe region based on satellite images.

eTrace – eLearning platform for developing learning materials by graphical annotations on 3D objects.

MedioGrid – first national Grid infrastructure for research and education (2006).

The offer addressed to the economic environment

Research & development in core areas	GPU cluster and Cloud computing High performance processing and visualization Geospatial service oriented architectures
Research & development in applied fields	Development of Earth Science oriented applications Earth Observation big data processing and classification
Consulting	Graphics modelling and simulation User interactive application development methodology High performance computation
Training	User interactive application development methodology Usability evaluation of graphical user interfaces