



8th Workshop of

LICIA

<http://licia-lab.org>

September 27th–28th, 2018

Laboratoire d'Informatique de Grenoble
Bâtiment IMAG

700 avenue Centrale, 38401 Saint-Martin-d'Hères, France

Grenoble

Scientific Program



Program at a glance

– Thursday, September 27th, 2018 –

9h00	Welcome coffee
9h30	WG1: High-Performance Computing with Arnaud Legrand (Polaris), Jean-Marc Vincent (Polaris) and Lucas M. Schnorr (UFRGS), Philippe O. A. Navaux (UFRGS)
9h30	WG2: Data Science with Sihem Amer-Yahia (SLIDE) and João Comba (UFRGS), Cicero Pahins (UFRGS)
9h30	WG3: Spatial/Temporal Information Systems with Paule-Annick Davoine (LIG/Pacte Grenoble), Luciana Nedel (UFRGS) and Jorge Wagner (UFRGS)
12h00	Lunch-break
13h30	WG4: Performance Analysis with Arnaud Legrand (Polaris), Jean-Marc Vincent (Polaris) and Lucas M. Schnorr (UFRGS), Philippe O. A. Navaux (UFRGS)
15h00	Theme-based Coffee-break • Working Groups & Follow-up Discussions
15h30	First-day wrap-up
20h00	Dinner at the <i>Ferme des Charrières</i> with a little walk (<i>randonnée</i>) before the dinner

– Friday, September 28th, 2018 –

09h00	Opening: Welcome LIG • Brasil–France collaboration : CNRS, INRIA, UGA, UFRGS • LICIA – 8 years of joined research between Lig and UFRGS/INF
10h00	CAPES/Cofecub Project Presentation Group Formation, Analysis, and Visualization in Big Data by João Comba (UFRGS)
10h15	Coffee-break
10h45	Session #1: Young Researcher Presentations • Danilo Santos: Learning On-line Batch Scheduling Policies (Datamove) • Pedro Bruel: A Design of Experiments Approach to Autotuning (Polaris) • Marceley Zanon-Boito: Unsupervised Word Segmentation from Speech with Attention (Getalp) • Cicero Pahins: Real-Time Exploration and Analysis of Big Data (UFRGS)
12h00	Lunch-break
13h15	Session #2: Young Researcher Presentations • Jorge Alberto Wagner Filho: VirtualDesk: A Comfortable and Efficient Immersive Visualization Approach • Francieli Zanon Boito: Extreme-scale data management for the convergence of HPC and Big Data (Corse) • Aline Menin: Environment to Assist the Geovisual Analysis of Individual Mobility Data (Steamer) • Bruno Donassollo: Fog Based Framework for IoT Service Provisioning (Orange/Polaris)
14h30	Keynote <i>The Role of Human Factors in Virtual Marketplaces</i> by Sihem Amer-Yahia (LIG/CNRS)
15h30	Perspectives
16h00	Closure + Coffee-break

Preceding Meeting

The LICIA workshop takes place after the 30th International Symposium on Computer Architecture and High-Performance Computing (SBAC-PAD 2018). This symposium takes place at the ENS Lyon on September 24-27, 2018. Many people involved in the LICIA are part of the SBAC-PAD technical program and will meet there early that week.

Keynotes

Keynote: *The Role of Human Factors in Virtual Marketplaces*

by **Sihem Amer-Yahia (LIG/CNRS)**

Abstract: TBD

Bio: TBD

Post-Doc Presentations

30 minutes each

Post-Doc #1 *Extreme-scale data management for the convergence of HPC and Big Data*

by **Francieli Zanon Boito (Corse)**

Abstract: The HPC and Big Data fields, that developed somewhat separately, are now converging as HPC workloads become more data-intensive and Big Data becomes more compute-intensive. In this talk, I will discuss the DAMA project, which is concerned with the I/O challenges that arise from the convergence between these two different paradigms.

Post-Doc #2 *Real-Time Exploration and Analysis of Big Data*

by **Cícero Augusto de Lara Pahins (INF/UFRGS)**

Abstract: A fundamental problem in modern visual data analysis is how to build data exploration environments that support interactive exploration of large datasets. This problem has two opposing facets. From one side, the ever-growing complexity and size of datasets bring the need to provide complex navigation and visual summaries capabilities. On the other hand, human perception and cognition pose a challenge on how long the data handling and rendering loop can take. The exploration and analysis through aggregation of these datasets is a valuable opportunity to researchers, that often find tools, such as histograms and heat maps, best suited for the task.

PhD Student Presentations

15 minutes each

Young #1 *Learning On-line Batch Scheduling Policies*

by **Danilo Santos (Datamove)**

Abstract: We present a methodology based on simulation and machine learning to obtain on-line batch scheduling policies. Using simulations and a workload generation model, we can determine the characteristics of tasks that lead to a reduction in the mean slowdown of tasks in an execution queue. Modeling these characteristics using a nonlinear function and applying this function to select the next task to execute in a queue improved the mean task slowdown in the scheduling simulation of many synthetic and real workloads.

Young #2 *A Design of Experiments Approach to Autotuning*

by **Pedro Bruel (Polaris)**

Abstract: We present a strategy for autotuning high-performance computing kernels that decreases the number of experiments required to find optimizations by exploring search spaces using D-Optimal experimental designs.

Young #3 *Unsupervised Word Segmentation from Speech with Attention*

by **Marcely Zanon Boito (Getalp)**

Abstract: In the context of computation language documentation, we present a first attempt of performing attentional word segmentation directly from speech signal, with the final

goal being to automatically identify lexical units in a low-resource, unwritten language. The comparisons to monolingual and bilingual baselines illustrate the potential of attentional word segmentation for language documentation.

Young #4 *Environment to Assist the Geovisual Analysis of Individual Mobility Data*

by **Aline Menin (Steamer)**

Abstract: The study of individual mobility data helps to understand the mobility variety and the context diversity where displacements and activities takes place, which is relevant to better orientate public politics actions to urban mobility, increasing accessibility and improving the inhabitants' everyday life. Therefore, we propose a new paradigm to visually explore this data, which integrates well-known and accepted visualization techniques, and non-conventional interaction interfaces.

Young #5 *Fog Based Framework for IoT Service Provisioning*

by **Bruno Donassollo (Orange/Polaris)**

Abstract: To this day, the Internet of Things (IoT) continues its explosive growth. Nevertheless, with the exceptional evolution of traffic demand, existing infrastructures are struggling to resist. In this context, Fog computing is shaping the future of IoT applications. It offers nearby computational, networking and storage resources to respond to the stringent requirements of these applications. However, despite its several advantages, Fog computing raises new challenges which slow its adoption down. Hence, there is a lack of practical solutions to enable the exploitation of this novel concept. To deal with this shortcoming, we propose FITOR, an orchestration system for IoT applications in the Fog environment. This solution builds a realistic Fog environment while offering efficient orchestration mechanisms. In order to optimize the provisioning of Fog-Enabled IoT applications, FITOR relies on 0-FSP, an optimized fog service provisioning strategy which aims to minimize the provisioning cost of IoT applications, while meeting their requirements. Based on extensive experiments, the results obtained show that 0-FSP optimizes the placement of IoT applications and outperforms the related strategies in terms of i) provisioning cost ii) resource usage and iii) acceptance rate.

Young #6 : *VirtualDesk: A Comfortable and Efficient Immersive Visualization Approach*

by **Jorge Alberto Wagner Filho (UFRGS)**

Abstract: 3D representations are potentially useful under many circumstances, but suffer from long known perception and interaction challenges. Current immersive technologies, which combine stereoscopic displays and natural interaction, are being progressively seen as an opportunity to tackle this issue, but new guidelines and studies are still needed, especially regarding information visualization. In this work, we implement and evaluate an alternative data exploration metaphor, named VirtualDesk, where the user remains seated and viewpoint change is only realisable through physical movements. All manipulation is done directly by natural mid-air gestures, with the data being rendered at arm's reach. The

virtual reproduction of the analyst's desk aims to increase immersion and enable tangible interaction with controls and two dimensional associated information. Currently, this approach is being adapted to an inherently 3D representation in the

Geovisualization domain: the Space-Time Cube. We hypothesise that immersive exploration will increase the usability of this tool, potentially increasing analysts' performances in the identification of movement features and patterns.