



guidebook

16° WORKSHOP DE

# WORCAP



COMPUTAÇÃO

2016  
PLICADA

25 e 26 de outubro de 2016

Auditório Fernando de Mendonça - LIT  
Instituto Nacional de Pesquisas Espaciais

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**Livro de Resumos**  
**16 Workshop de Computação Aplicada**  
Pós-Graduação em Computação Aplicada (CAP)

25 e 26 de outubro de 2016

Auditório Fernando de Mendonça, Laboratório de Integração e Testes (LIT)  
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## SESSÃO TÉCNICA 2

### DISCUSSÕES SOBRE ESTABILIDADE EM METODOS ADAPTATIVOS

*Muller Lopes, Margarete Domingues, Odim Mendes*

Dentro do contexto das ciências espaciais, existe a necessidade da obtenção das soluções de simulações numéricas em um tempo computacional baixo. Neste contexto, são aplicadas técnicas de malha adaptativa, como refinamento adaptativo de malhas e as técnicas de multirresolução adaptativa. Visando complementar estas técnicas, são utilizados esquemas de tempo local para reduzir ainda mais o tempo computacional necessário para a simulação e aproveitar as condições locais do número de Courant em esquemas explícitos temporais. Tais esquemas espaciais consistem em realizar a evolução temporal de forma individual em cada célula da malha, de forma que cada célula possua um passo temporal proporcional ao seu refinamento. Esta metodologia requer procedimentos de sincronização da solução durante as operações de projeção e predição da solução entre níveis de resolução adjacentes, incluindo erros numéricos que podem afetar a estabilidade do modelo. Assim é necessário conhecer a estabilidade numérica do esquema empregado para a escolha de parâmetros referentes à simulação, como número de Courant. Além disto, determinar a estabilidade de um método auxilia na escolha de um passo temporal que permite um custo computacional reduzido, de forma que não comprometa a qualidade da solução. Neste trabalho é apresentado uma análise sobre a estabilidade numérica dos esquemas de tempo local.

### PARTIAL SYNCHRONIZATION IN RANDOM NETWORKS OF NON-LINEARLY COUPLED OSCILLATORS: THE DESERTER HUBS MODEL

*Celso Freitas, Elbert Macau, Arkady Pikovsky*

We study the Deserter Hubs Model: a Kuramoto-like model of coupled identical phase oscillators on a network, where attractive and repulsive couplings are balanced dynamically due to nonlinearity of interactions. Under weak force, an oscillator tends to follow the phase of its neighbors, but if an oscillator is compelled to follow its peers by a sufficient large number of cohesive neighbors, then it actually starts to act in the opposite manner, i.e. in anti-phase with the majority. Analytic results yield that if the repulsion parameter is small enough in comparison with the degree of the maximum hub, then the full synchronization state is locally stable. Numerical experiments are performed to explore the model beyond this threshold, where the overall cohesion is lost. We report in detail partially synchronous dynamical regimes, like stationary phase-locking, multistability, periodic and chaotic states. Via statistical analysis of different networks, we found a measure allowing one to predict relative abundance of partially synchronous stationary states in comparison to time-dependent ones.

## SESSÃO TÉCNICA 3

### EVOLUTION OF WEB SERVICES CONTRACTS AND THEIR VARIABILITY DURING THE LIFE CYCLE OF THE PROJECT

*Diego Benincasa, Eduardo Guerra*

During a software system life cycle, project modifications occur for different reasons, either for natural evolution or requisites readjustment. Regarding web services, communication contracts modifications are equally usual, which induces the need for adaptation in every system node, from the client to the server side. The more significant those changes are, the greater the effort required for this adjustment. To help reducing the contracts changing impact over software source code, easy-to-adapt systems can be designed in order to minimize the application remodeling effort. However, to make this approach possible, it is necessary to understand how those contract changes occur, analyzing the most common modification types and how often they happen. In this sense, the present work evaluates the change history of different open-source projects whose web service contracts are defined using Web Service Description Language (WSDL) documents with XML Schema Definition (XSD). It is desirable that the results of this evaluation underpin modification patterns or tendencies in projects like defined before in order to carry on web services development. This work presents a study on analyzing XSD schemas and inspecting the evolution of three XSD tag types during the project life cycle, using the MetricMiner tool combined with XMLUnit Java library. As a result, it was possible to evaluate the frequency of changes per tag type, classified by modification type. Based on that, it was possible to assess what exactly is changed inside the schemas at each commit. This outcome can possibly reveal contracts changing patterns and support easy-to-adapt web services implementation.

### A SYSTEMATIC MAPPING IN SOFTWARE ANALYTICS

*Joelma Choma, Eduardo Guerra*

The application of Software Analytics (SA) in software development has become increasingly popular in the last years. Taking into account a growing complexity of the software projects, the idea of analytics is to leverage potentially large