

FoCAS Project's Interview with Dr. Phan Cong Vinh, ICCASA 2013 General Chair

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Dr. **Phan Cong Vinh**, Nguyen Tat Thanh University in Vietnam, General Chair of the 2nd International Conference on Context-Aware Systems and Applications (ICCASA 2013) shares with Prof. Giacomo Cabri, a FoCAS project's member, his reflections on collective adaptive systems and applications. Dr. Vinh answers to the four questions highlighting his current role, the important topics in the field of collective adaptive systems, the specific challenges to be faced and underlining a long-term impact of this research in terms of applications

Who are you?

At present, I am a member of Nguyen Tat Thanh University (NTTU) to take on the responsibility of a Deputy Head of Faculty of Information Technology. I have been author or co-author of many refereed contributions published in prestigious journals, conference proceedings or edited books. I am the author of a book on computing science titled “Dynamic Reconfigurability in Reconfigurable Computing Systems: Formal Aspects of Computing” (VDM, 2009); editor of two titles, “Autonomic Networking-on-Chip: Bio-Inspired Specification, Development and Verification” (CRC Press, 2012) and “Formal and Practical Aspects of Autonomic Computing and Networking: Specification, Development and Verification” (IGI Global, 2011); editor of Special Issues, “Context-Awareness of Mobile Systems: Models, Algorithms and Applications” (Springer MONET (SCIE),



2012, 2014) and “Advances in Autonomic Computing: Formal Engineering Methods for Nature-Inspired Computing Systems” (Springer TCS, 2012). I have served on many conference program committees and have been general or technical chair and organizer of several international conferences such as ICCASA and ICTCC series. My research interests center on all aspects of formal methods, nature of computation and communication, and applied categorical structures in computer science.

Which are the important topics in the field of Collective Adaptive Systems?

Collective adaptive systems consist of many autonomous units that interact in context-awareness. Basically they focus on

- Context-aware systems,
- Developing novel approaches to self-* systems:
- Establishing collectives with the ability to detect, diagnose and repair failures for themselves.

Which are the specific challenges to be faced?

One of hot topics in collective adaptive systems is currently context-awareness, which is basically inspired by the human autonomic nervous system. Context-awareness is characterized by its self-* facets such as self-organization, self-configuration, self-healing, self-optimization, self-protection and so on. Context-awareness used to dynamically control computing and networking functions. The overall goal of context-awareness is to realize nature-inspired autonomic systems that can manage themselves without direct human interventions. Meeting this grand challenge of context-awareness requires a rigorous interdisciplinary approach to collective adaptive systems.

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Which can be a long-term impact of this research in terms of applications?

A first area of interest concerns the **Person Context Awareness**. The recent emergence of the so-called **social networks**, the widespread presence of smartphones equipped by many kind of sensors, which enable analysis of new context definitions that may concern individual, social, and urban scenarios. Indeed, recently, the available information may include mobility patterns of people and also physical activities (as movements), physical status, and emotional conditions. This information is often acquired and shared, in real time, by users. Allowing the reliable extraction and sharing of that information is a fundamental research issue with important applications. It could improve the experience of individual, communities, organizations, and societies by adapting context to the environment (home, hospitals, campuses, offices, etc.).

Another area in this field deals with the **Object Context Awareness**. Context awareness may be implemented using quite different aspects under different environments, conditions, and layers such as layered context-aware architecture for middleware, context awareness for connecting entities of network components, and infrastructure (as internet protocol, handoff management, sensing, network requirements, network controls and network implementation).