



BIONETS E-News

Bio-Inspired Networks and Services

www.bionets.eu

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Dear BIONETS members,

As always, we welcome your comments and suggestions. If you would like to participate or contribute to the content of the E-Newsletter, please feel free to contact us at bionets-website@create-net.org

BIONETS News

- The first workshop on eNetworks Cyberengineering took place in Montreal, Canada. The abstract of the papers can be found at: <http://www.smc2007.org/workshops.html>
- The first Workshop on Situated and Autonomic Communications was successfully organized in conjunction with BIONETICS 2007, and provided the opportunity to present the latest results from the SAC projects. The technical program of the workshop can be found at:

<http://www.bionetics.org/sac.shtml>

- The paper "Constrained Stochastic Games in Wireless Networks" from E. Altman, K. Avrachenkov, N. Bonneau, M. Debbah, R. El-Azouzi and D. Sadoc Menasche, received the best paper award at IEEE Globecom 2007.
- The paper "Evaluating Activator-Inhibitor Mechanisms for Sensors Coordination" from G. Neglia and G. Reina, received the best paper award at BIONETICS 2007.

Upcoming Project Meetings

BIONETS Review Meeting

Turin, IT, Mar. 6–7, 2008

The second BIONETS project review meeting will be held in Turin, Italy, on the 6th and 7th March 2008. A tentative agenda of the review meeting is available

on BSCW.

Second FIRE Workshop

After the successful FIRE workshop of 2007 in Zurich, a second related event SAC-FIRE workshop

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will be held in Turin, in conjunction with the SAC projects review. The program of this year is very ambitious, with outstanding key note speakers and

panel.

New Deliverables & Publications

Note: for more details and PDF version, where available, please check the project Web site www.bionets.eu

Eigenvalue-based trust and reputation measures

Type: Deliverable (D2.2.7)

In the Deliverable D2.2.7 "Eigenvector based reputation measures" we have considered the application of various eigenvalue based or graph based reputation measures for BioNets. We have concentrated on distributed approaches. In particular, we have described the following three approaches: aggregation/decomposition approach, asynchronous approach and an approach based on personalized rank vectors. We conclude that the asynchronous approach and personalized rank vectors approach are particularly suited for BioNets as they essentially use local computations.

Graph-based Service Individual specification: Creation and Representation

Type: Deliverable (D3.2.3)

D 3.2.3 aims at specifying the representation of BIONETS services in order to make possible their creation and their evolution. This deliverable investigates existing solutions relying on components and workflow composition models, and suggests an unified view allowing both models to interoperate safely and efficiently. A graph specification is proposed to unify those different point of view and allow an easy evolution of the composition of BIONETS services.

BIONETS concept business evaluation and fine-tuning

Type: Deliverable (D3.3.2)

This document aims to present a selective view of the case for user- level business models that can be defined in the BIONETS environment.

The complementary sources of this work are D3.3.1 and ID3.3.2 (Internal Deliverable 3.3.2) as well as common deliverables on BIONETS Application Scenarios (NOKIA) and the current project discussions that will determine the nature and evolution of the

services at both the application or service and network layers. This document consists of seven sections and concludes with some reflections on the evolution of the applications models using the BIONETS infrastructure.

Denial-of-Service Resistant Data Dissemination in BIONETS

Type: Deliverable (D4.3)

In this Deliverable, data dissemination in BIONETS is studied from a Denial-of-Service (DoS) point of view. More specifically, data dissemination is considered as a service provided collaboratively by the U-nodes. The main objective of this Deliverable is to identify the main sources of a potential DoS attack against the data dissemination process and to propose a method to prevent it. According to this, in the first part of the Deliverable, an overview is given on the various data dissemination approaches that were introduced by other work packages in BIONETS. We conclude that due to the inherent redundancy in the system, an adversary can not completely prevent the spreading of messages. However, a potentially serious problem is that the quality of the service provided by the system heavily depends on the users' willingness to cooperate. Therefore, in the second part of the Deliverable, we focus on prevention of selfish behavior as the main source of DoS, and we propose a novel data dissemination mechanism that discourages selfishness. In the proposed mechanism, the users trade in messages, meaning that they can download a message from another user only if they also provide a message in return. The proposed solution is analyzed using a game theoretic framework, and it is shown that it indeed discourages selfishness.

Journal Publications

- D. Miorandi, E. Altman and G. Alfano, "The Impact of Channel Randomness on Coverage and Connectivity of Ad Hoc and Sensor Networks", to appear in IEEE Trans. Wireless Comms., 2007
- A. Panagakis, A. Vaios, I. Stavrakakis, Approximate Analysis of LRU in the Case of Short Term Correlations, to appear in Computer Networks.

Book Chapters

- Roberto Battiti, Mauro Brunato. "Reactive Search: Machine Learning for Memory-Based Heuristics". In: Teofilo Gonzalez (ed.), *Approximation Algorithms and Metaheuristics*, Taylor and Francis, in press, 1Q2007.
- L. Pelusi, A. Passarella, and M. Conti, "Encoding for Efficient Data Distribution in Multi-hop Ad hoc Networks", in *Handbook of Wireless Ad hoc and Sensor Networks*, A. Boukerche, Editor, Wiley and Sons Publisher (to appear).
- Ahmad Al-Hanbali, Mouhamad Ibrahim, Vilmos Simon, Endre Varga, "A Survey of Epidemic Based Routing Protocols", Springer LNCS, 2007 (to appear).

Conference Publications

- V. Simon, L. Bacsardi, S. Szabo and D. Miorandi, "BIONETS: a New Vision of Opportunistic Networks", in Proc. of IEEE WRECOM, Rome, Italy, Oct. 2007.
- I. Carreras, D. Miorandi and I. Chlamtac, "From Biology to Evolve-Able ICT Systems", in Proc. of IEEE SMC (workshop on eNetworks), Oct., 2007.
- D. Miorandi, I. Carreras, E. Altman, L. Yamamoto and I. Chlamtac, *Bio-Inspired Approaches for Pervasive Computing Environments*, BioWire Workshop Notes (to appear).
- F. De Pellegrini, D. Miorandi, D. Linner, L. Bacsardi and C. Moiso, "BIONETS: from Networks to SerWorks", in Proc. of SAC Workshop (BIONETICS), Budapest, Hungary, Dec. 2007.
- S. Alouf, I. Carreras, D. Miorandi and G. Neglia, "Embedding Evolution in Epidemic-Style Forwarding", in Proc. of BioNetworks (IEEE MASS), Pisa, Italy, Oct. 8, 2007.
- H. Tembine, E. Altman and R. El-Azouzi, "Delayed Evolutionary Game Dynamics applied to the Medium Access Control", Proc. of Bionetworks (IEEE MASS), Pisa, Italy, Oct. 8, 2007.
- E. Altman, K. Avrachenkov and A. Garnaev, "Closed form solutions for water-filling problem in optimization and game frameworks", in Proc. of GameComm, Nantes, France, Oct. 22, 2007.
- E. Altman, S. Sarkar and E. Solan, "Constrained Single-Controller Stochastic Games", to appear in Proc. of SMCtools, Nantes, France, Oct. 26, 2007.
- T. Hamidou, E. Altman, R. El-Azouzi and Y. Hayel, "Multiple Access Game in Ad-hoc Network", to appear in Proc. of GameComm, Nantes, France, Oct. 22, 2007.
- E. Altman, M. Debbah, A. Silva and P. Bernhard, *Continuum Equilibria for Routing in Dense Ad-hoc Networks*, in Proc. of the 45th Annual Allerton Conference on Communication, Control and Computing, Urbana-Champaign, Illinois, Sep., 2007.
- K. Avrachenkov, D. Nemirovsky and S. Pham, "A survey on distributed approaches to graph based reputation measures", to appear in Proc. of SMCtools, Nantes, France, Oct. 26, 2007.
- F. Baude, L. Henrio and P. Naoumenko, "A Component Platform for Experimenting with Autonomic Composition". Invited paper to appear in Proc. of Autonomics, Roma, Italy, Oct., 2007.
- S. Lasaulce, A. Suarez, M. Debbah and L. Cottatellucci, "Power allocation game for fading MIMO multiple access channels with antenna correlation", in Proc. of GameComm, Nantes, France, Oct. 22, 2007.
- E. Altman, S. Sarkar and E. Solan, "Constrained Single-Controller Stochastic Games", to appear in Proc. of SMCtools, Nantes, France, Oct. 26, 2007.
- E. Altman, K. Avrachenkov, N. Bonneau, M. Debbah, R. El-Azouzi and D. Sadoc Menasche, "Constrained Stochastic Games in Wireless Networks", in Proc. of IEEE Globecom, Washington D.C., Nov., 2007. Received the Best paper award.
- E. Altman and R. El-Azouzi, *Non-cooperative game theory applied to telecommunication networks*, (in French) in *Annales des Telecommunications*, 2007.
- F. Baude, D. Caromel, L. Henrio, P. Naoumenko, "A Flexible Model and Implementation of Component Controllers", Selected and revised papers from the CoreGRID workshop on Grid programming model, Grid and P2P systems architecture, Grid systems, Tools and Environments, June 2007. Springer-Verlag (to appear) 2008.
- Lidia Yamamoto, Daniel Schreckling, Thomas Meyer: "Self-Replicating and Self-Modifying Programs in Fraglets", in Proc. of BIONETICS, Budapest, Hungary, Dec. 2007.
- Lidia Yamamoto, "PlasmidPL: A Plasmid-Inspired Language for Genetic Programming", EuroGP poster session, Naples, Italy, Mar., 2008.
- D. Linner, H. Pfeffer, I. Radusch, and S. Steglich, "Biology as Inspiration towards a new Service Life-Cycle". In Proc. of ATC, Hong Kong, China, July 11-13.
- David Linner, Heiko Pfeffer, and Stephan Steglich, "A genetic algorithm for the adaptation of service compositions". In Proc. of SAC Workshop (BIONETICS), Budapest, Hungary, Dec. 12, 2007.
- Elena Balandina, *New Route Classification Method for Networks with Static Routing* presented at IT-Com 2007 in Boston.
- P. Dini and D. Schreckling, "More note on abstract algebra and logic: Towards their application to cell biology and security", OPAALS Workshop, Rome, 26-28 Nov.
- V. Simon, L. Bacsardi, M. Berces, E. Varga, T. Csvorics, S. Szabó, S. Imre, "Overhead Reducing Information Dissemination Strategies for Opportunis-

tic Communications”, in Proc. of MWCN 2007, Cork, Ireland, Sep. 19-21, 2007.

- Fabio Martinelli and Marinella Petrocchi, “Access control mechanisms for fraglets”, in Proc. of BIONETICS 2007, Budapest, Hungary, Dec. 2007.
- D. Bliedernicht and D. Schreckling, “Highly Adaptive Cryptographic Suites for Autonomic WSNs”, in Proc. of SAC Workshop (BIONETICS), December 13, 2007, Budapest, Hungary.
- Ludovic Henrio, “A Component Platform for Experimenting with Autonomic Composition”, in Proc. of AUTONOMICS, Rome, Italy, Oct. 28-30, 2007.
- G. Neglia and G. Reina, “Evaluating Activator-Inhibitor Mechanisms for Sensors Coordination”, in

Proc. of BIONETICS, Budapest, Hungary, Dec., 2007.

Demo Presentations

- I. Carreras, D. Tacconi and D. Miorandi, “Data-Centric Information Dissemination in Opportunistic Environments”, in Proc. of IEEE MASS (Demo Session), Pisa, Italy, Oct., 2007.
- I. Carreras and D. Tacconi, “U-Hopper: User-centric Heterogeneous Opportunistic Middleware”, in Proc. of SAC Workshop Demo Session (BIONETICS), Budapest, Hungary, Dec., 2007.

Open CfPs and Submission Deadlines

- **UBICOMP**
Submission deadline: Apr. 4
Web site: ubicomp.org/ubicomp2008/
- **ACM MobiCom**
Submission deadline: Mar. 7
Web site: www.sigmobile.org/mobicom/2008/
- **MOBIQUITOUS**
Submission deadline: Mar. 8
Web site: www.mobiquitous.org/
- **IEEE MASS**
Submission deadline: Mar. 8

Web site: www.cse.psu.edu/IEEEMASS08/

- **SecureComm**
Submission deadline: Mar. 24
Web site: www.securecomm.org/2008/
- **ACM SenSys**
Submission deadline: Apr 7
Web site: sensys.acm.org/2008/
- **IEEE SASO**
Submission deadline: May 5
Web site: polaris.ing.unimo.it/saso2008/

Upcoming Conferences and Symposia

- **WiOpt**
Berlin, Germany, Mar. 31 - Apr. 4 2008
- **PerCom**
Hong Kong, 17-21 Mar. 2008
- **EvoStar**
Napoli, Italy, Mar. 26-28 2008

- **IEEE INFOCOM**
Phoenix, AZ, US, 15-17 Apr. 2008
- **ACM Mobihoc**
Honk Kong, China, May. 26-30
- **MobiSys 2007**
Breckenridge, Colorado, US, Jun. 17-20 2008