On the possibility of turning an arbitrary graph into a complex network, using rewiring mechanisms

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Abstract—The abstract goes here.

Index Terms—Computer Society, IEEE, IEEEtran, journal, LaTeX, paper, template.

1 Introduction

This demo file is intended to serve as a "starter file" for IEEE Computer Society journal papers produced under LaTeX using IEEEtran.cls version 1.8b and later. I wish you the best of success.

mds
August 26, 2015

1.1 Subsection Heading Here

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1.1.1 Subsubsection Heading Here

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2 Related work

3 Methods

3.1 General operation

- Frequency of use of dynamic links during the exploration phase (f_e).
- Frequency of visits to candidate nodes during the exploration phase (f_n).

3.2 Initial conditions

3.2.1 Initial graph

3.2.2 routing algorithm

Se lanzan 20 paquetes - (numero de nodos)
Numero de brazo dinamicos / longitud D (routing)
Two-dimensional grid graph (Kleinberg - navegability)
Compass routing

3.2.3 Coordinator election

3.3 Rewiring mechanism

Explicar el papel del coordinador. Cuenta los ciclos ejecutados y coordina el inicio y final de las fases de exploración y recableo The rewiring mechanism is a distributed process executed a determined number of cycles. A cycle of the rewiring mechanism consist of the following phases:

3.3.1 Exploration

During this phase, each node sequentially sends twenty tracer packets to arbitrary destination nodes. Packets are routed applying compass routing. Destination nodes respond to a tracer packet with an acknowledgment packet containing the path followed by the tracer packet. When a node receives an acknowledgment packet, it updates its vectors f_e and f_n. A node finishes its exploration phase when it has received acknowledgements packets for its twenty tracer packets.

3.3.2 Exploration synchronization

This phase starts when the coordinator node has finished its exploration phase. Then it starts a PIF algorithm to spread messages asking if the rest of nodes have finished its exploration phase. When the coordinator node receives an acknowledgement from all the nodes in the network, it starts a PI algorithm to spread messages notifying that nodes must start its rewiring phase.

3.3.3 Rewiring

Each node starts its rewiring phase when it receives a notification from the coordinator. Then, the notified node uses the information in its vectors f_e and f_n to take a rewiring decision according to one of the following rules:

- **Rule 1**. The node rewires its least used dynamic link (according with f_e) to the most visited node (according to f_n).
- **Rule 2**. The node rewires its least used dynamic link (according with f_e) to the first node at distance 2 from it. Said node is the first node in f_n.

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3.3.4 Rewiring synchronization

Analogous to the *Exploration Synchronization phase*, this phase starts when the coordinator node has finished its rewiring phase. Then it starts a PIF algorithm to spread messages asking if the rest of nodes have finished its rewiring phase. When the coordinator node receives an acknowledgement from all the nodes in network, it checks if all cycles have been completed. If so, the rewiring mechanism finishes. Otherwise, the coordinator node starts a PI algorithm to spread messages notifying that the cycle has finished and nodes must start the *Exploration phase* of a new cycle.

4 Results

FUTURE WORK-Impact of the initial graph

FUTURE WORK-Impact of the routing algorithm

FUTURE WORK–Porque solo 20 paquetes, depende del orden del grafo- Impact of the number of exploration packets

4.1 Impact of the length of dynamic link

4.2 Información para recableo

- Medir los paquetes

Reglas de recableo - Actualizar en distintos ciclos

- Longitud a distancia en el grafo u otro espacio no euclidiano

- Propagación de epidemias

5 Conclusion

The conclusion goes here.

Appendix A
Proof of the First Zonklar Equation

Appendix one text goes here.

Appendix B

Appendix two text goes here.

Acknowledgments

The authors would like to thank...

References

[1] H. Kopka and P. W. Daly, *A Guide to LaTeX*, 3rd ed. Harlow, England: Addison-Wesley, 1999.

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Michael Shell Biography text here.

John Doe Biography text here.

Jane Doe Biography text here.