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# Ant Colony Optimization Scheduling

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# Motivation

Why Ant Colony Optimization?

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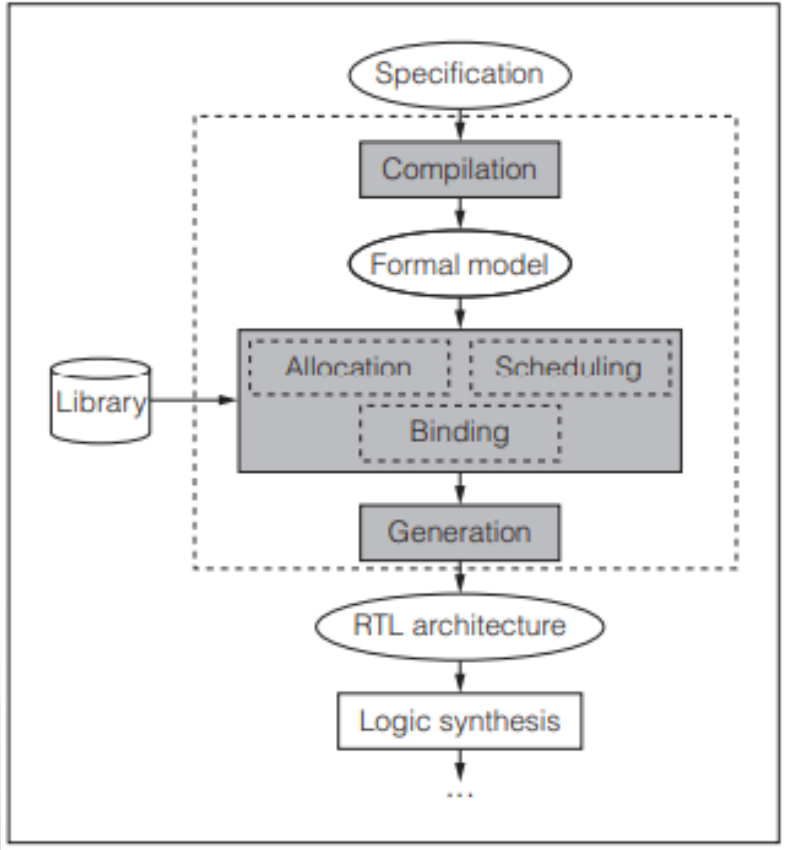
# I. Introduction

- **What is HLS?**

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# I. Introduction

- **What is a Hardware/Software Codesign?**

It sums up in putting the effort of designing hardware and software elements collaborating into one single design.

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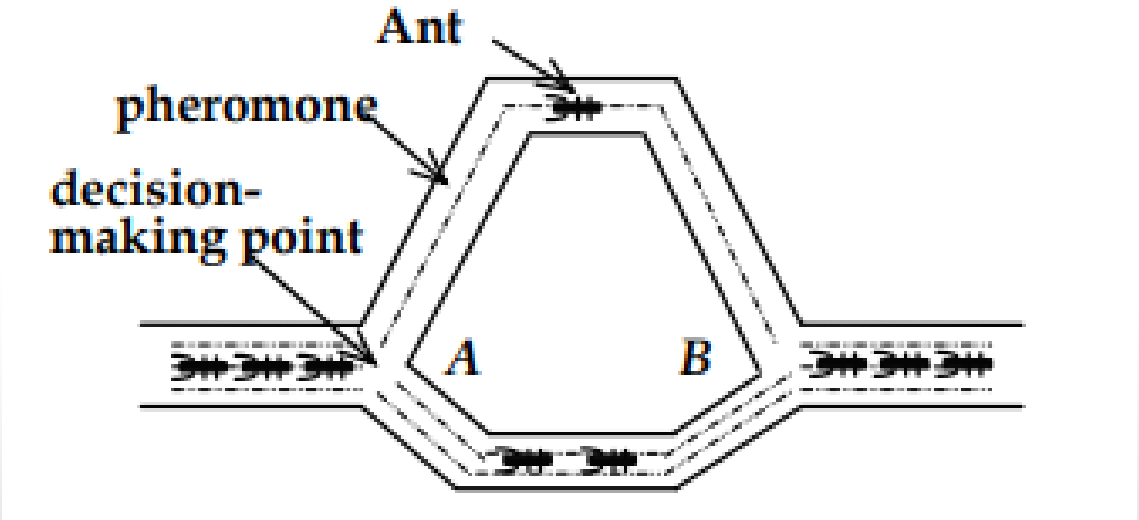
# II. Foundations

- **ACO**

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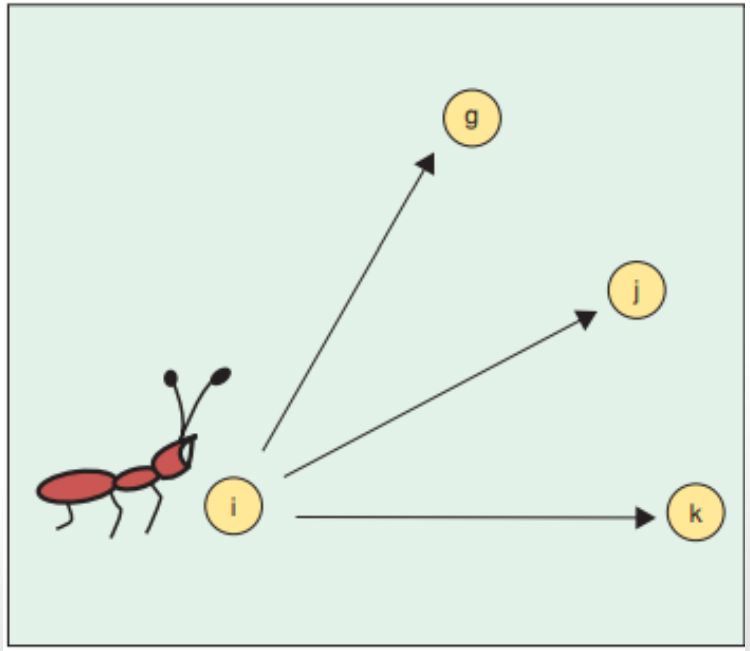
# II. Foundations

- **TSP problem and ACO**

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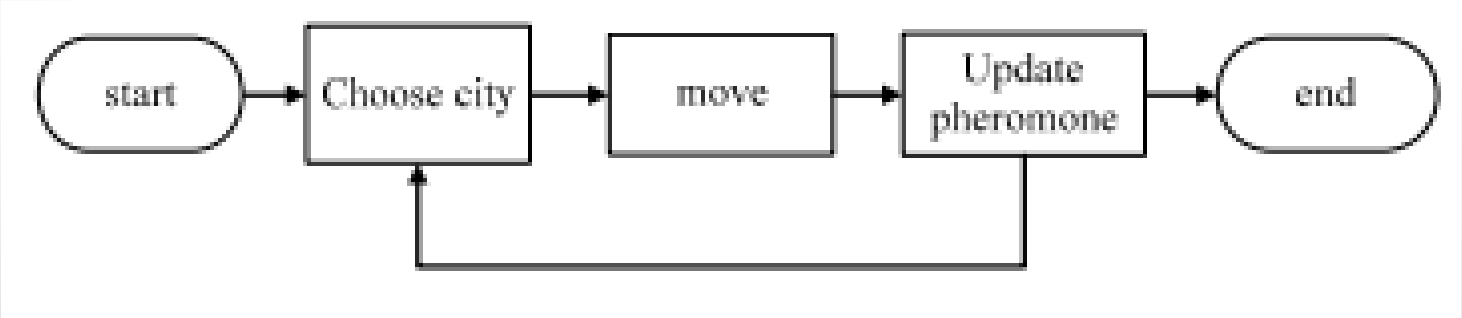
# II. Foundations

- **ACO algorithm flow**

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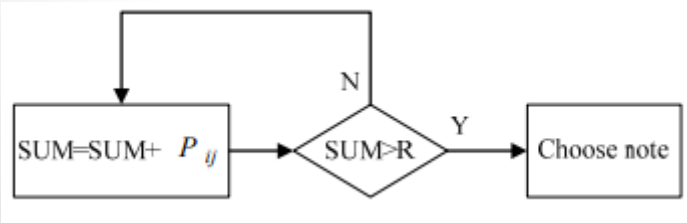
# II. Foundations

- **ACO path possibilities**

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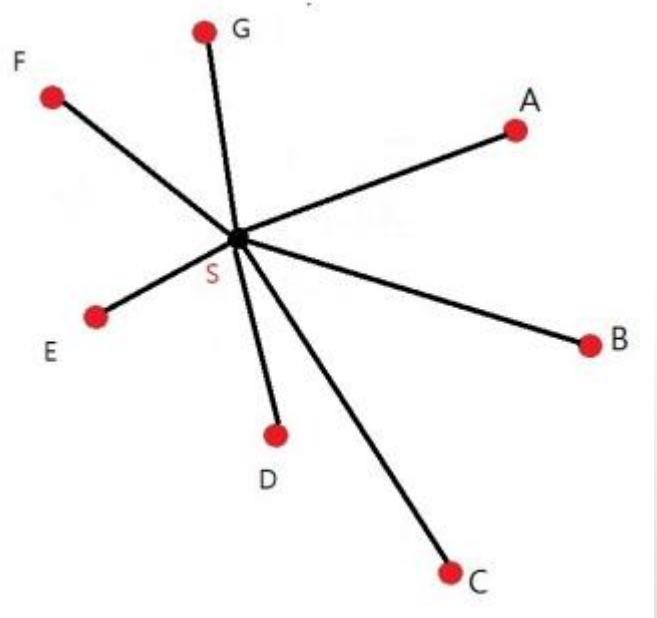


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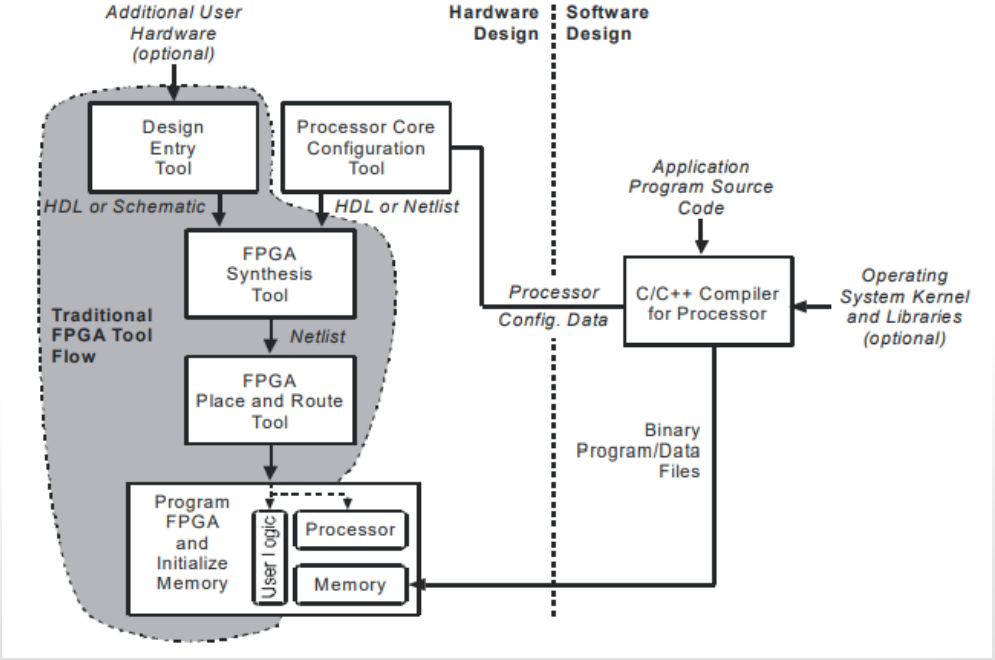
# III. ACO and HLS integration

- **SOPC**

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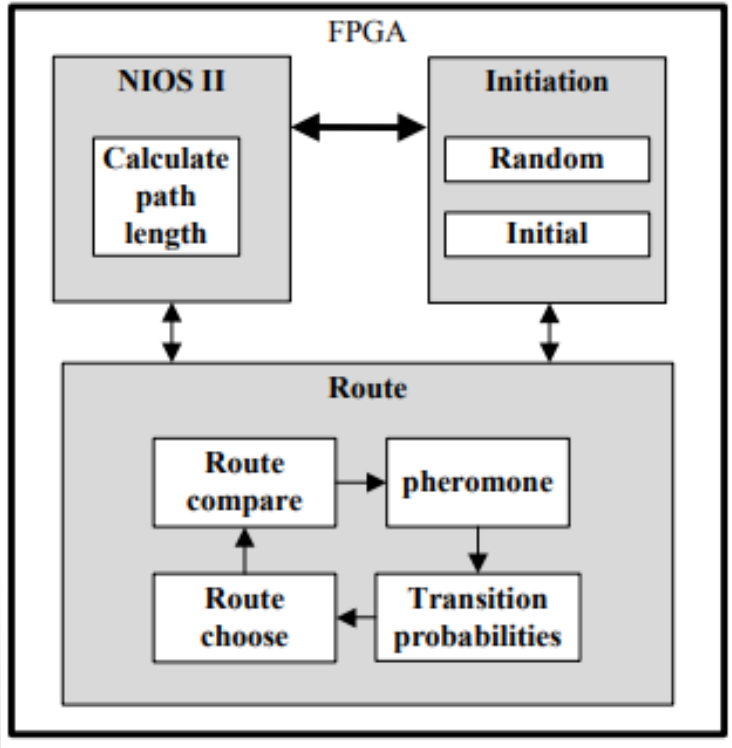
# ACO and HLS integration

- **ACO Mapping On FPGA:**

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# Conclusion

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# Questions?

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# References

[1]: P. Coussy, D. D. Gajski, M. Meredith and A. Takach, ”An Introduction to High-Level Synthesis,” in IEEE Design & Test of Computers, vol. 26, no. 4, pp. 8-17, July-Aug. 2009, doi: 10.1109/MDT.2009.69.
[2]: Enxiu Chen and Xiyu Liu, ”Multi-Colony Ant Algorithm,” in Ant Colony Optimization Methods and Applications, A. Ostfeld, Ed. Rijeka, Croatia: InTech, 2011, pp. 3-6.
[3]: M. Dorigo, M. Birattari and T. Stutzle, ”Ant colony optimization,” in IEEE Computational Intelligence Magazine, vol. 1, no. 4, pp. 28-39, Nov. 2006, doi: 10.1109/MCI.2006.329691.
[4]: Shih-An Li, Min-Hao Yang, Chung-Wei Weng, Yi-Hong Chen, Chia- Hung Lo, and Ching-Chang Wong. ”Ant colony optimization algorithm design and its FPGA implementation,” 2012 International Symposium
on Intelligent Signal Processing and Communications Systems, Tamsui, Taiwan, 2012, pp. 262-265, doi: 10.1109/ISPACS.2012.6473492.
[5]: T. S. Hall and J. O. Hamblen, ”Using system-on-a-programmable-chip technology to design embedded systems,” in Proceedings of the IEEE, vol. 13, no. 3, pp. 142-152, Sep. 2006.