Post-Doc - The blockchain Lightning Network, an Ant Routing Approach

About Pôle Léonard de Vinci: The Leonard de Vinci Pole is made up of three higher education institutions offering recognized degree programs that cover complementary academic fields, particularly in the digital sector: a business school, EMLV (Leonard de Vinci Business School); an engineering school, ESILV (Leonard de Vinci Engineering School), and a digital/multimedia school, IIM (Institute of Internet and Multimedia). The schools share a common research laboratory: De Vinci Research Center (DVRC).

About DVRC: The "De Vinci Research Center - DVRC" includes all the researchers from the two schools of the Leonard De Vinci Association: the School of Management (EMLV) and the School of Engineering (ESILV). The research, focused on innovation and digital technology, is structured within four research groups and a partnership research unit.

Context: Through the Pôle Léonard de Vinci, DVRC is a member of the "Moneytrack" project on blockchain scalability, together with INRIA and Truffle Capital.

Postdoctoral Researcher: As a member of the "Moneytrack" project funded by Bpifrance**,** DVRC is looking for a postdoctoral researcher working in the area of computer network security and blockchain technology. The candidate will be working on an implementation of the Ant routing algorithm for the Lightning Network.

Topic: The ambition of the Lightning Network is to provide a second layer to the Bitcoin network to enable transactions confirmed instantly, securely and anonymously with a world scale capacity using a decentralized protocol. However, some of the current propositions and implementations present some difficulties in anonymity, scaling and decentralization. The Ant Routing algorithm for the Lightning Network solves several problems such as channel information update and centralization by beacon nodes. It requires no landmark, no knowledge on the topology. The decentralization of the algorithm is achieved by making every node play exactly the same role in the routing process and using only knowledge about its neighbors. Routing tables are not required and transactions are completed instantaneously and anonymously. The algorithm is inspired by the behavior of ants. Although each ant individually seems to follow a random motion, their collective behavior finds efficiently the shortest path from their nest to a food source. This is achieved through a "stygmergic" communication of the ants with their environment through pheromones. See
https://arxiv.org/abs/2002.01374

Goal: The candidate will:
1. Implement carefully the Ant Routing Algorithm and compare it with existing decentralized algorithms in both performance and anonymity,
2. Develop a web platform to highlight the approach with the Ant Routing Algorithm, implementation details, simulations and a demonstration scenario,
3. Collaborate on a research article to describe and compare strengths and weaknesses of the algorithm compared to other proposals.

Requirements: Candidates should have a PhD in Computer Science or a related area. They should have a promising publication record and be interested in cryptocurrencies.

Conditions:
Postdoctoral Positions last a maximum of 12 months. Salary is competitive.

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Application: Qualified candidates should apply online.
https://www.devinci.fr/le-pole/recrutement/
Please provide your CV and a cover letter describing your research activities.