Lucero Labs

SSI Engineering Internship Program

Building the Future of Digital Identity

https://www.lucerolabs.xyz/

Duration: September 2025 - December 2025 (4 months, extendable to 6 months)
Commitment: Part-time, 20 hours/week (4h/day)
Compensation: $1,200 USD/month
Location: Hybrid (Colegiales coworking + remote)

1. About Lucero Labs

We are Lucero Labs, a startup modernizing trust through cutting-edge identity solutions. Our flagship product, Autopen, is a blockchain-backed digital signature platform built on QuarkID for the City of Buenos Aires.

Our Backing

- Funded by Avalanche Foundation
- Part of the Crecimiento movement
- Mission: Moving Argentina on-chain

Current Impact

- Processing real-world digital signatures with blockchain verification
- Building infrastructure for Argentina's digital transformation

2. The Challenge

We need to modernize our Self-Sovereign Identity (SSI) stack. Our current QuarkID implementation, while functional, was built as a proof-of-concept. Now we're scaling to serve millions of Buenos Aires residents.

The Mission: Modernize QuarkID's SSI stack from proof-of-concept to production-grade infrastructure. This involves evaluating existing frameworks (like Credo-TS from Hyperledger), potentially building custom solutions, and ensuring seamless compatibility with Buenos Aires' existing integrations.

Why This Matters

- **Real impact:** Your code will serve Buenos Aires' population
- **Open source:** Contributing to Linux Foundation projects
- **Cutting-edge:** Working with W3C standards, DIDs, Zero-Knowledge Proofs

3. What You'll Build

Core Project: QuarkID Stack Modernization

- Research and evaluate modern SSI frameworks (Credo-TS, Veramo, custom solutions)
- Design migration strategy from current proof-of-concept to production-grade architecture
- Implement chosen solution with full Buenos Aires government compatibility
- Contribute improvements back to the broader SSI ecosystem

Technical Stack You'll Master

- **Languages:** TypeScript/Node.js (primary), Go (secondary)
- **Cryptography:** BBS+ signatures, Zero-Knowledge Proofs, Digital signatures
- **Standards:** W3C DIDs, Verifiable Credentials, DIDComm protocol
- **Blockchain:** Sidetree protocol, Ethereum EVM, Smart contracts
- **Framework:** Modern SSI frameworks (Credo-TS, Veramo, or custom architecture)

4. Potential Focus Areas

Choose based on your interests and strengths:

Architecture Track

- Evaluate and compare SSI frameworks (Credo-TS vs Veramo vs custom)
- Design scalable architecture for government deployment
- Build framework-agnostic compatibility layers

Cryptography Track

- Update signature schemes to latest standards (BBS+, etc.)
- Implement selective disclosure and zero-knowledge presentations
- Optimize cryptographic performance for mobile devices

Integration Track

- Mobile SDK development for React Native
- Government API integrations
- Performance optimization for high-throughput scenarios

5. Your Learning Journey

Month 1-2: Foundation

- Master SSI concepts and W3C standards
- Deep dive into QuarkID architecture and current limitations
- Research and evaluate modern SSI frameworks
- **Deliverable:** Technical architecture recommendation with migration strategy

Month 3-4: Implementation

- Build production-grade SSI stack using chosen approach
- Implement compatibility layers for Buenos Aires integrations
- Create comprehensive testing and validation suite
- **Deliverable:** Working production-ready system

Month 5-6: Advanced (If Extended)

- Lead contributions to chosen open source frameworks
- Optimize for Buenos Aires deployment scale (performance, security)
- Document best practices and mentor next cohort
- **Deliverable:** Recognized contributions to SSI ecosystem

6. Who We're Looking For

Academic Background

- Final year students in Computer Science, Software Engineering, or related fields
- Strong theoretical foundation in algorithms and data structures
- Previous exposure to cryptography or distributed systems (preferred)

Technical Skills

- **Proficient:** TypeScript/JavaScript, Node.js
- **Familiar:** Git workflows, testing frameworks, async programming
- **Bonus:** Go, React Native, blockchain development, cryptography

Personal Qualities

- **Self-directed:** Can navigate ambiguous technical challenges
- **Communication:** Ability to document and explain complex concepts
- **Growth mindset:** Excited to learn cutting-edge technologies
- **Impact-driven:** Motivated by real-world applications

7. Application Process

Step 1: Technical Assessment

Scenario: QuarkID uses custom DID methods that Credo-TS doesn't recognize. You need to implement a resolver.
Your Challenge: You're new to SSI and need to understand these concepts first. Create a prompt that helps you:

- Understand what DID methods and resolvers are
- Learn how Credo-TS implements DID resolution
- Design a custom resolver for QuarkID's DID format

We want to see: How you approach learning unfamiliar technical domains

Step 2: Technical Interview

- 45-minute technical discussion
- Code review of a small take-home challenge
- Architecture and design thinking evaluation

Step 3: Paid Trial Project

- 1-week paid engagement ($300)
- Real contribution to QuarkID/Credo-TS integration
- Mutual evaluation of working relationship

8. Application Requirements

Submit by August 28th, 2025:

- Resume/CV highlighting relevant technical experience
- GitHub profile showcasing your best code
- Technical Prompt Response (see Step 1 above)
- Brief cover letter explaining your interest in SSI and Lucero Labs

Send to: hello@lucerolabs.xyz
Subject: "SSI Engineering Intern - [Your Name]"

9. Conclusion

Ready to help build Argentina's digital future? Apply now and join us in modernizing trust for millions of people. This internship offers a unique opportunity to work on cutting-edge technology that will have real-world impact while contributing to open source projects that shape the future of digital identity.

Lucero Labs is an equal opportunity employer committed to diversity and inclusion.