

## Sihao (Ben) Lu

### Staff iOS engineer, full stack experience

#### Employment History

##### iOS engineer at Block

March 2020 — Present

- As the founding mobile engineer, architected and created Square messages that enables two-way communication between buyers and sellers through SMS, email and facebook messenger on all five Point-of-Sales verticals. 290k MAU on iOS devices.
- Built up the client team of two peer iOS engineers and 2 fellow android engineers and one web engineer. Participated in hiring two of them. Mentored one intern.
- Led the integration of Square messages cross functionally within Block including finetuned GPT-2 driven suggested replies, appointments, invoices, coupons. Enriched Square messages with photos and voice-mail support.
- Proselytized the adoption of swift-composable-architecture from Workflow and migrated the messages codebase to Swift Concurrency & Combine.
- Actively involved in a task force to dissect the monorepo into modularized structure that minimizes inter-dependency to allow isolated development.
- Held 150+ coding, Q&A and architecture interviews since starting at Block.

##### Backend engineer at Block

September 2017 — March 2020

- Owned development life cycle of Square loyalty and gift card services using Java service containers:
  - Developed and maintained Square Loyalty public APIs and webhooks.
  - Brought Square E-Gift card experience (creation, editing and gifting) to iOS by working end-to-end from backend to the client.
  - Reviewed metrics and responded to oncall pagers. Mentored one new grad.

##### Web engineer at Block

July 2016 — September 2017

- Revamped Square loyalty onboarding flow within Square's dashboard. The flow consists of two loyalty sub-configurations and an upsell for the seller to subscribe to the service.
- Added and exposed loyalty-specific settings to the sellers.

##### Intern at Box

July 2015 — August 2015

- Integrated Box iOS app with 3D viewer that can render .obj files.
- Implemented exponential backoff for retrying fetching files.

##### Intern at Microsoft, Redmond

July 2014 — August 2014

- Composed a script that monitors the nodes during Azure cloud disaster recovery.

## Satellite Forecast @ App Store

November 2022 — Present

**App store:** <https://apps.apple.com/us/app/satellite-forecast/id1578649430>

**Website:** <http://satellite-forecast.square.site/>

- Designed and created an app that predicts International Space Station, Tiangong and 4000+ satellite passes over any location. The app also includes real time star map showing satellite currently passing and allows setting local notification alarms.
- Built with SwiftUI, Combine, and SwiftRex architecture, leveraging SQLite R-Trees to speed up star queries, and off-screen rendering to cache star maps.
- Targeted mostly for astronomy enthusiasts, it received 3000 impressions and 200+ downloads since release on Dec 2022.
- Shipped a companion Wechat mini-program written in Javascript.

## Planetarium app: Graviton @ Github

February 2017 — January 2019

**Link:** <https://github.com/DJBen/Graviton>

- Designed and created an app that displays 3D-rendered planetarium star map that allows time travel and location customization. Included 100k stars from the HYG catalog. Calculated solar system bodies' ephemerides.
- Leveraged SQLite for performance. Rendered with SceneKit and Metal shaders.
- Shipped Carthage-compatible dependencies as companion repos: [Spacetime](#) performs astronomy calculations; [StarryNight](#) offers star catalog queries.

## Bachelor, Johns Hopkins University

September 2012 — June 2016

- Graduated with 3.6 GPA in Dean's list.
- Relevant classes: Computer graphics, machine learning, distributed systems, database.

[Github](#)

[LinkedIn](#)

**Architectures:** [swift-composable-architecture](#), [Workflow](#), MVVM(-C) / MVC, [RIBs](#)

**Domain specific knowledge:**

- Swift, Objective-C; SwiftUI, [Blueprint](#), UIKit.
- Cocoapods, Bazel, SwiftPM.
- Swift Concurrency, Reactive programming (Combine, ReactiveSwift, RxSwift).
- SQLite, Realm, Core Data.
- Push notifications, sockets, localization, accessibility.

- **Backend:** MySQL, Redis, TiDB.
- **Frontend:** React, Ember.js
- **Cloud Stack:** Docker, AWS Lambda, DynamoDB.
- **Monitoring & Metrics:** SignalFx, Snowflakes, Amplitude.
- **Languages:** Swift, Python, Javascript / Typescript, Java