

# Andrew McKnight

## Curriculum Vitæ

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### Education

- 2013 **M.Sc., Dept. of Computer Science**, Old Dominion University.
- Thesis track in bioinformatics, robotics, image processing and meshing research topics
    - Thesis: "Protein Loop Length Estimation from Medium Resolution CryoEM Images"
  - Three published papers with two conference presentations
  - C++ programming TA for three semesters
  - Minor in actuarial mathematics

### Publications

- 2013 **Estimating loop length from CryoEM images at medium resolutions**, <http://www.biomedcentral.com/content/pdf/1472-6807-13-S1-S5.pdf>.
- 2013 **Estimating Lower Bounds on the Length of Protein Polymer Chain Segments using Robot Motion Planning**, <https://class-pages.pages.cs.odu.edu/crtcpub/publications/estimating-lower-bounds-on-the-length-of-protein-polymer-cha-2013/>.
- 2012 **CryoEM Skeleton Length Estimation using a Decimated Curve**, <https://class-pages.pages.cs.odu.edu/crtcpub/publications/cryoem-skeleton-length-estimation-using-a-decimated-curve-2012/>.

### Experience

- Jan 2021 – **Sentry**, *Senior iOS Developer*, Remote, (FTE).
- Current
- Application observability platform
  - **Stack:** Objective-C++, Swift, XcodeGen, GitHub Actions, SauceLabs, Swiftlint, clang-format, CodeCov, pre-commit, Fastlane
  - **Deliverables:**
    - **Sentry Cocoa SDK:** mobile app crash and performance monitoring
    - **Highlights:**
      - Integrating Specto's profiling feature into Sentry's Cocoa SDK
      - User Feedback widget: first user-facing UI shipped in Sentry Cocoa SDK
      - Wrangled sample and demo apps for developers and Sales team
      - Numerous improvements to CI and build system
- Nov 2019 – **Specto**, *Senior iOS Developer*, Remote, (FTE).
- January 2021
- Mobile app profiling SDK with shared C++ core between iOS and Android
  - **Stack:** Objective-C++, Swift, Go, Python, Jinja, Bazel, XcodeGen, GitHub Actions
  - **Deliverables:** Mobile app profiling SDK with shared C++ core between iOS and Android, Python scripts to generate scoped Xcode projects from Bazel targets (pre 'rules-xcode')
  - **Highlights:**
    - Python scripts to generate scoped Xcode projects from Bazel targets (pre 'rules-xcode')
    - Acquired by Sentry in December 2020
- Jan 2019 – **Rightpoint Consulting**, *Senior iOS Developer*, Remote, (Contract-to-Perm).
- Oct 2019
- Security-focused app and SDK (NDA)
  - **Stack:** Swift, SwiftGen, SwiftLint, Sourcery, CircleCI, Postman, Browserstack, Countly

- Jan – Apr **121nexus**, *iOS Developer*, Remote, (Contract).
- 2018
- Medical inventory management app/SDK with barcode/QR scanning
  - **Stack:** Swift, AVFoundation, OpenCV, Firebase, cocoapods-keys, AWS
  - **Highlights:**
    - Replaced application UI and networking with their new SDK
    - Reimplemented major area of app with new UI and platform API
    - Added crash reporting (Crashlytics) and logging (XCGLogging)
    - Augmented and documented analytics (Firebase)
    - Assisted launches via iTunes ([121 Scan](#)) and another internal enterprise app
- Dec 2016 – **Layer**, *iOS Developer*, Remote, (FTE).
- Jul 2017
- In-App Messaging SDK
  - **Stack:** C/ObjC/Swift, CocoaPods, OCMock, Specta/Expecta, Jenkins, Rails, Thrift, WebSockets/SPDY, SQLite
  - **Deliverables:** ObjC SDKs for data and UI components, an embeddable app layer and fully-functional sample app
  - **Highlights:**
    - Rearchitected test suite to separate unit tests from integration/end-to-end tests
    - Helped streamline developer environment configuration (Rake, Gems, CocoaPods and git submodules)
    - Migrated old SPDY/Thrift architecture to WebSockets with rewritten Thrift specs
    - Implemented new auth and transport layer using [TransitionKit](#)
- Apr 2015 – **Twitter**, *Software Engineer*, Cambridge, MA, (FTE).
- Dec 2016
- Mobile app crash reporting and analytics
  - **Stack:** C/ObjC/Swift, Java/Scala/Clojure, Rails, React/Coffeescript, Storm/Heron, Cascading/Scalding, Graphite, Vertica/Zeppelin, Beanstalk/Kafka, Redis/Cassandra, AWS, TeamCity, Chef, Trello, Protobuf
  - **Deliverables:** Crashlytics/Fabric SDKs, Mac app and command line tools, front- and back-end maintenance and analytics, Unity iOS support
  - **Highlights:**
    - Streamlined build and release processes with TeamCity agents deployed via Chef
    - Added Bitcode and tvOS compatibility to SDKs
    - Standardized config of all Xcode projects and released the open source [FABConfig](#)
    - Maintenance of backend lambda architecture with on-call rotations
    - Pioneered new backend feature to cross-reference common crashes across apps and present developers with suggested fixes
- Jan – Apr **MC10**, *iOS Developer*, Cambridge, MA, (FTE).
- 2015
- Companion iOS app for wearable peripheral with BTLE link
  - **Stack:** ObjC/Swift, CoreBluetooth, Android
  - **Deliverables:** Companion iOS app for wearable peripheral with BTLE link
  - **Highlights:**
    - Moved all app/demo code into Git repos, no previous SCM
    - Architected SDK and app codebases from the ground up
    - Built out greenfield app, in beta testing on my exit
    - Set up continuous integration and deployment with TeamCity and Fabric
    - Assisted adoption of Agile processes
- Jul 2013 – **Raizlabs**, *iOS Developer*, Boston, MA, (FTE).
- Dec 2014
- **Stack:** ObjC/Swift, Jenkins, TeamCity
  - **Deliverables:**
    - [Care.com](#): service seeker/provider matching (4 months)
      - iOS 7 redesign, with perspective zoom effect for a horizontally paged scroll view
      - Dynamic UI generation from server-supplied data
    - [B&H Photo](#): e-commerce (5 months)
      - Custom parallax scrolling of table view headers
      - Push notifications with deep linking
    - UniFirst: interactive enterprise sales catalog on iPad (8 months)
      - Drag and drop editing of clothing selections, with PDF report generation
    - [Invaluable](#): realtime high-end auction platform on iPad (1 month)
      - Paging of API result display in table/collection views

- Oct 2012 – **ODU Systems Lab, R&D projects**, Norfolk, VA, (Student Intern).
- May 2013
- **Deliverables:**
    - ChirpXM: location based social networking app (defunct)
    - Prototyped EMR iPad app for CHKD
  - **Highlights:**
    - Supervised two foreign exchange students
    - Facetime with onsite clients
- May – Oct 2013 **Intergraph, .NET CAD Application**, Hampton, VA, (Intern).
- **Stack:** C#, VisualBasic, SQL, QF-Test, Coverity, Visual Studio, TeamFoundation
  - Automated framework- and GUI-level testing, regression testing in numerical modules
  - Manual acceptance testing for new features and fixes
- Aug 2012 – **Old Dominion University, Undergraduate capstone project**, Norfolk, VA, (Seminar).
- May 2013
- **Stack:** ObjC, OpenEars, MapQuest
  - **Highlights:**
    - Co-lead of 7 member team
    - 4 presentations given to visiting professors and industry executives
    - Sole developer of iOS component of total solution
    - Highest scoring project!
- Aug 2012 – **Old Dominion University**, Norfolk, VA, (Research Assistant).
- May 2014
- Java and C++ algorithm development utilizing CGAL, Boost and Jama
  - Image processing, robotics and machine learning applications in bioinformatics
  - Multiple publications and conference presentations
- Aug 2012 – **Old Dominion University**, Norfolk, VA, (Lab Instructor).
- May 2014
- Online delivery of CS 333: Problem solving and programming in C++
  - Lab instructor for CS 250: Intermediate programming in C++
  - Assistant instructor for CS 150: Introduction to programming in C++
  - Website maintenance, grading, general student guidance
- Nov 2011 – **Insight Therapeutics, Medical**, Norfolk, VA & Remote, (Contract).
- Current
- **Stack:** ObjC/Swift, MessageUI, Storyboards, CoreGraphics, CoreData, FMDB, SQLite, SSZipArchive, RNCryptor, cocoapods-keys, Trello, BitBucket
  - **Deliverables:**
    - **ClotRx & DementiaRx:** reference e-pamphlets
      - Hybrid app with WKWebView
      - Searchable, bookmarkable HTML content extracted from PDFs
      - Interactive clinical surveys, print/email report generation
    - **Antibiotic Kinetics:** antibiotic dosage calculator
      - Ported from another developer's preexisting Android app
    - **eConsent:** HIPAA-compliant informed consent app for clinical trials
      - Interactive quiz-based presentation of study details
      - Signature collection and export to PDF
      - Interface with backend API to upload finished consents
  - Multiple releases and design iterations of all apps

## Honors & Awards

- 2013 **Gene Newman Award**, *Best overall paper*, Virginia Modeling, Analysis and Simulation Center Capstone conference.
- 2012 **Graduate with Distinction**, *Awarded with B.Sc.*, Old Dominion University.
- 2012 **Undergraduate Research Award**, *Outstanding undergraduate achievement*, ODU Spring Undergraduate Research Fair.
- 2011 **First Place**, ODU-ACM Programming Contest.
- 2010 – 2011 **Dean's List**, Old Dominion University.
- 2009 **Summa Cum Laude**, Piedmont Virginia Community College.

## Teaching and Presentations

- May 2018 **iOSDevCampCO**, *Colloquial Swift (45 min)*, Colorado Springs, CO.
- Presented findings from Colloquial Swift personal project (see entry in previous section)
- Jun 2017 **CocoaHeads Boston**, *UIViewController Decomposition and UI Reuse (20 min)*, MIT, Cambridge, MA.
- Discussing strategies to separate responsibilities from UIViewControllers and a library of reusable UI components, e.g. animated transparent modal presentation with a close button
- Jan 2017 **Boston Algorithms Meetup**, *HyperLogLog (20 min)*, Twitter, Cambridge, MA.
- Helped organized this initial meeting of the group
  - Covered the theoretical workings of the HyperLogLog algorithm, with a copresenter giving a working demonstration
- Jul 2016 **Girls Who Code**, *iOS Dev Session*, Twitter, Cambridge, MA.
- Part of GWC summer internship covering programming first principles to full-stack style development
  - Designed and led iOS session where we built a Flappy Bird clone, introducing them to Xcode as an IDE, Interface Builder, Playgrounds and Swift
- Mar 2016 **mDevCon**, *Command and NSOperation (45 min)*, Amsterdam, NL.
- Delivered presentation on the Command software design pattern, and NSOperation
  - Introduced subclasses we open sourced at Crashlytics for asynchronous and compound operations
  - Previously delivered at a lunchtime tech talk at Twitter, Cambridge, MA (Nov 2015) and CocoaHeads Boston meetup, MIT, Cambridge, MA (Dec 2015)
- Oct 2015 **NeighborNest**, *Web Dev Session*, Twitter, San Francisco, CA.
- Community program to help advocate technology literacy
  - Assisted in session where students worked on a Twitter clone, teaching functional programming concepts, Javascript, and some front- and back- end concepts
- 2013 **VMASC Capstone Conference**, *Estimating lower bounds on the length of protein polymer chain segments using robot motion planning*, Suffolk, VA.
- Presented research on using computational geometry and motion planning algorithms to model protein molecule structures
  - Best paper award
- Oct 2012 **IEEE WCSB**, *CryoEM skeleton length estimation using a decimated curve*, Philadelphia, PA.
- Presented research on using a dynamic graph algorithm to identify protein molecule substructures from 3D images