

Android Concurrency Frameworks: Introduction



Douglas C. Schmidt

d.schmidt@vanderbilt.edu

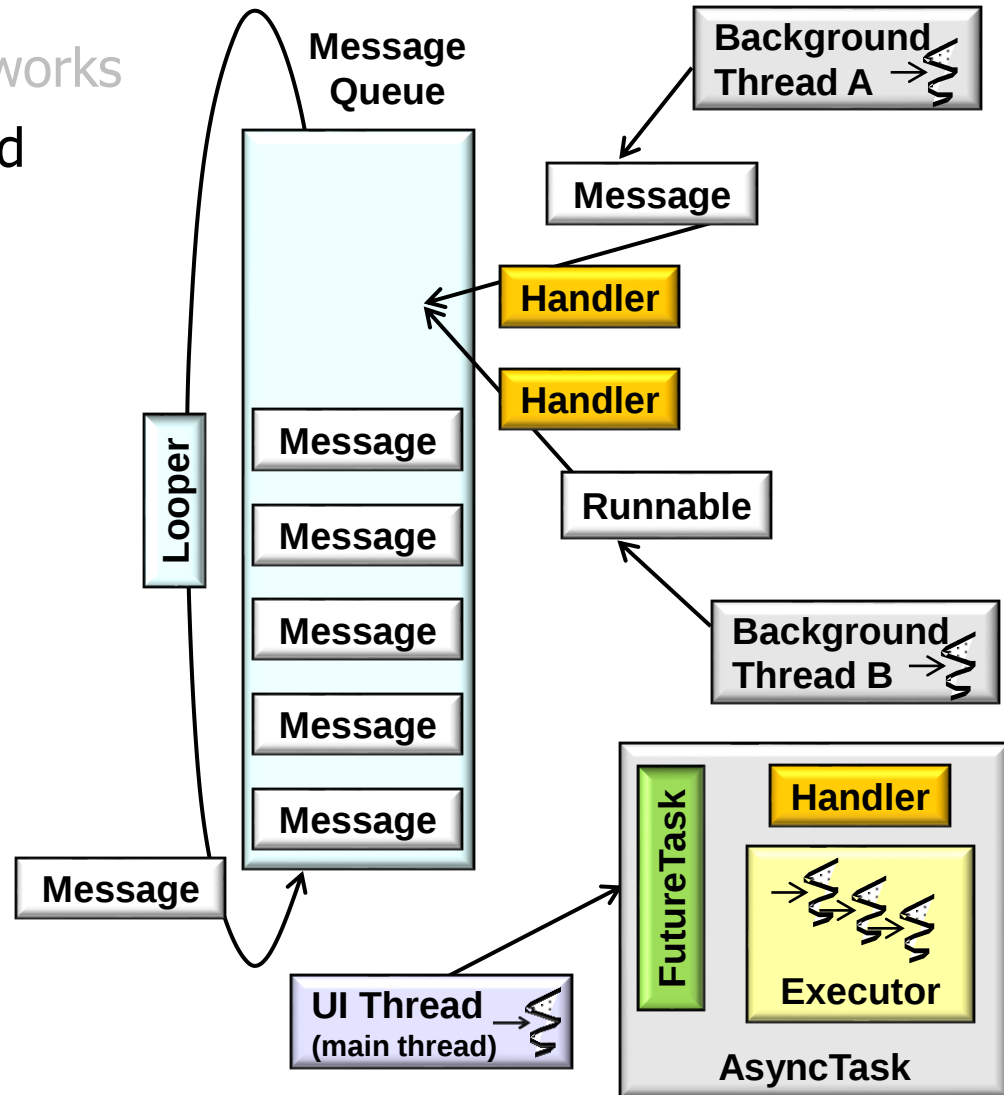
www.dre.vanderbilt.edu/~schmidt

**Institute for Software
Integrated Systems
Vanderbilt University
Nashville, Tennessee, USA**



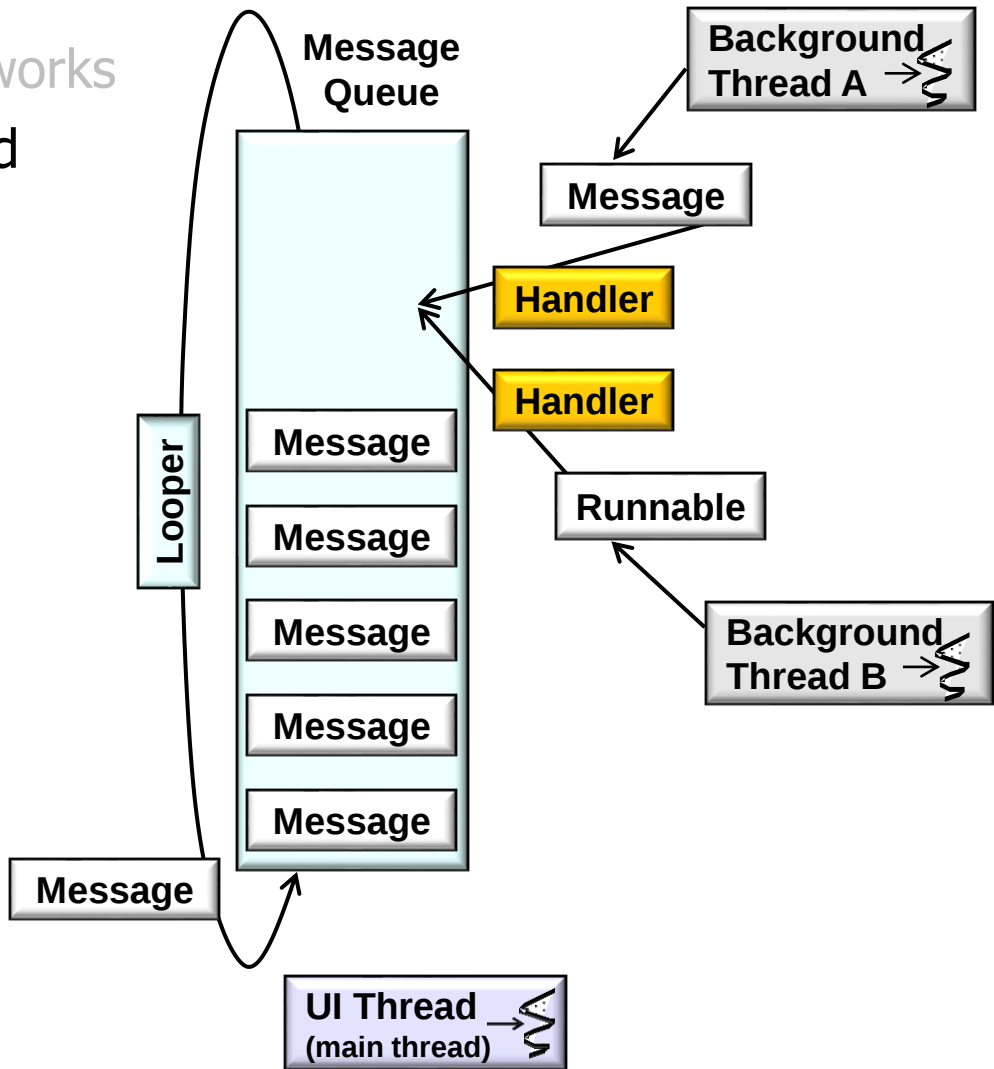
Learning Objectives in this Part of the Lesson

- Know the motivations for Android concurrency & concurrency frameworks
- Recognize the two types of Android concurrency frameworks



Learning Objectives in this Part of the Lesson

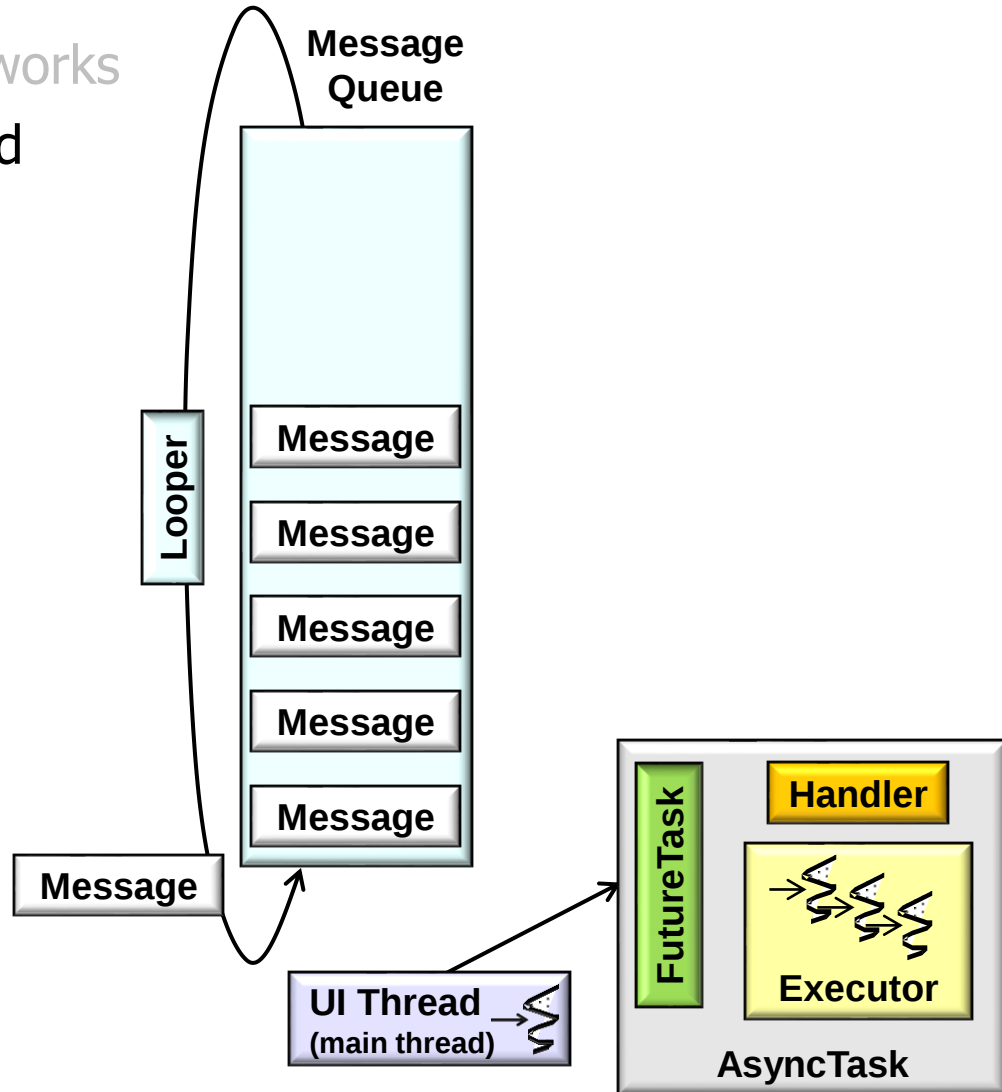
- Know the motivations for Android concurrency & concurrency frameworks
- Recognize the two types of Android concurrency frameworks, e.g.
 - Handler, Messages, & Runnables (HaMeR) framework



See code.tutsplus.com/tutorials/concurrency-on-android-using-hamer-framework--cms-27129

Learning Objectives in this Part of the Lesson

- Know the motivations for Android concurrency & concurrency frameworks
- Recognize the two types of Android concurrency frameworks, e.g.
 - Handler, Messages, & Runnables (HaMeR) framework
 - AsyncTask framework

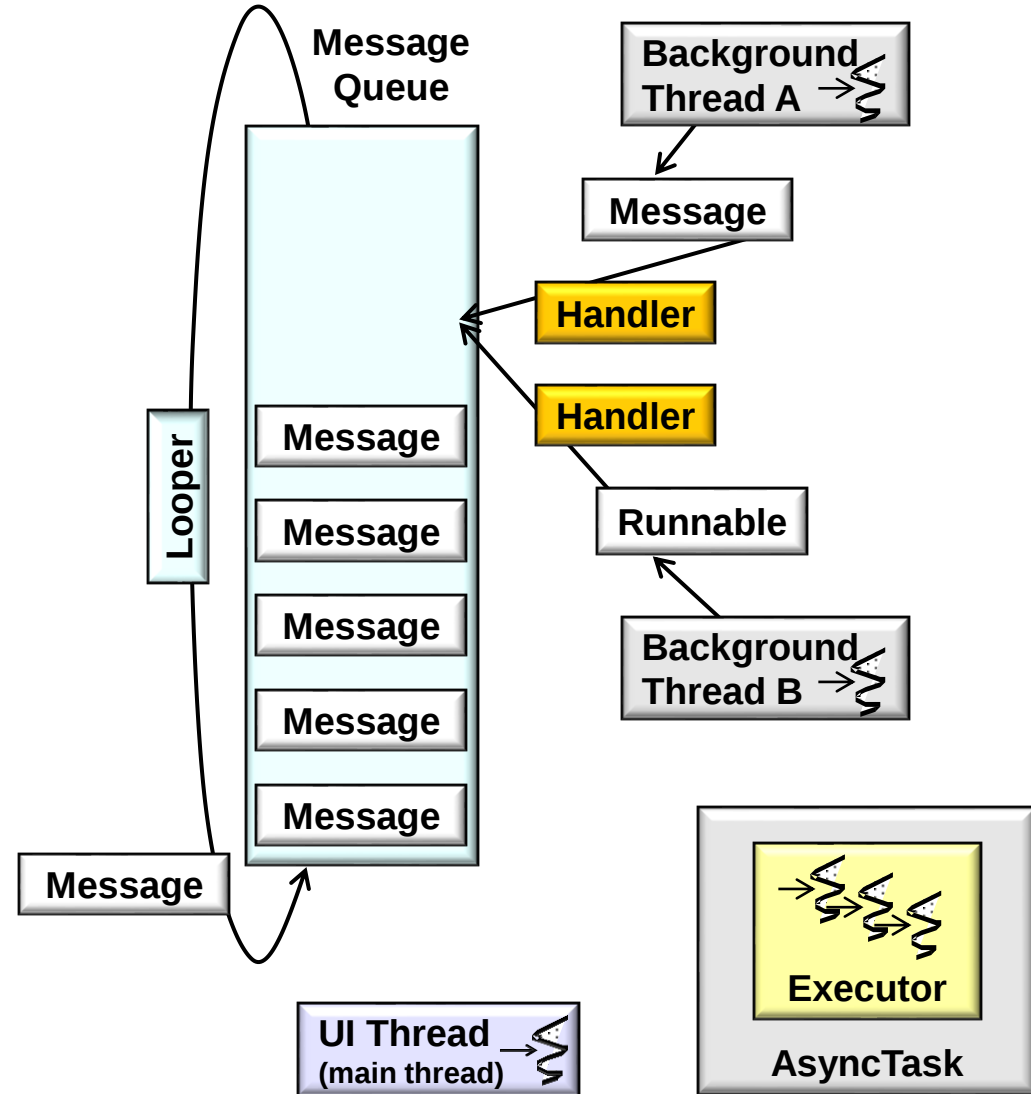


See developer.android.com/reference/android/os/AsyncTask.html

Overview of Android Concurrency Frameworks

Overview of Android Concurrency Frameworks

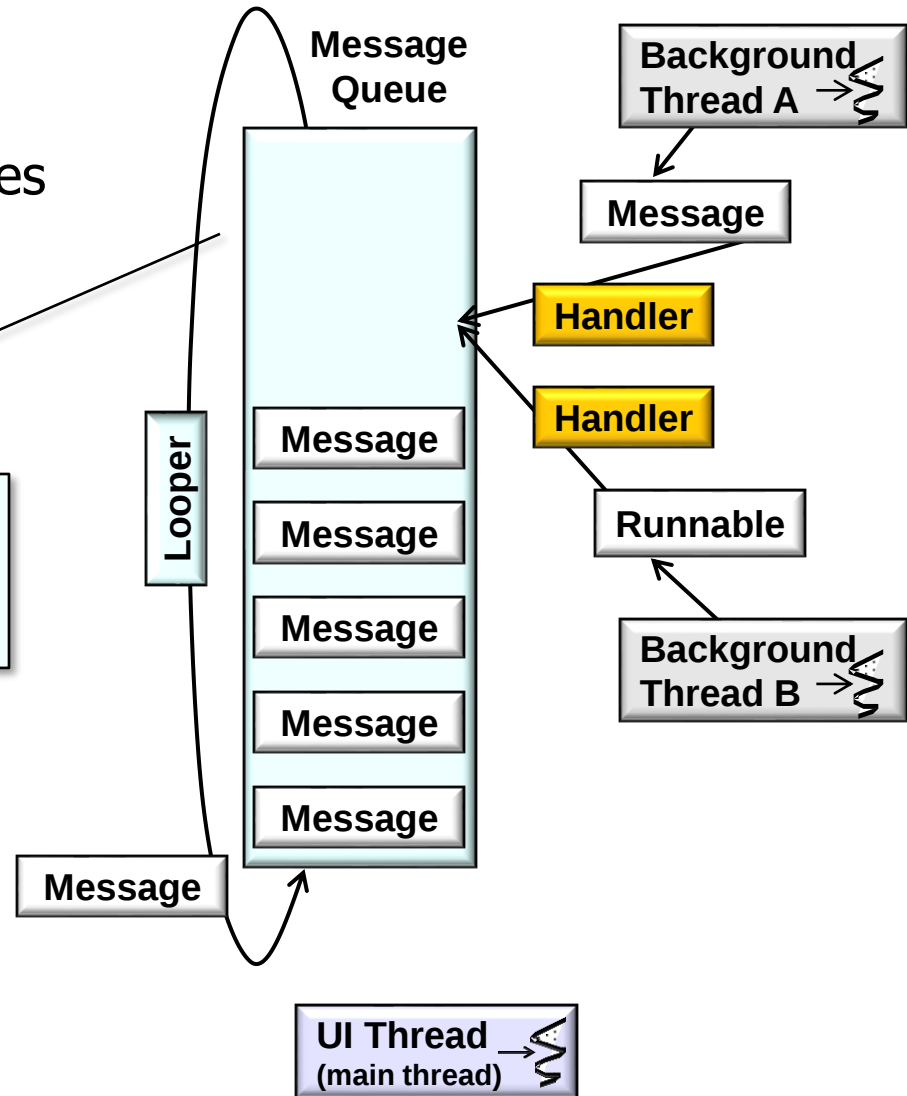
- Android defines two primary concurrency frameworks



Overview of Android Concurrency Frameworks

- Android defines two primary concurrency frameworks
 - Handlers, Messages, & Runnables (HaMeR)

Operations running in one or more background threads can post/send their results to the UI thread

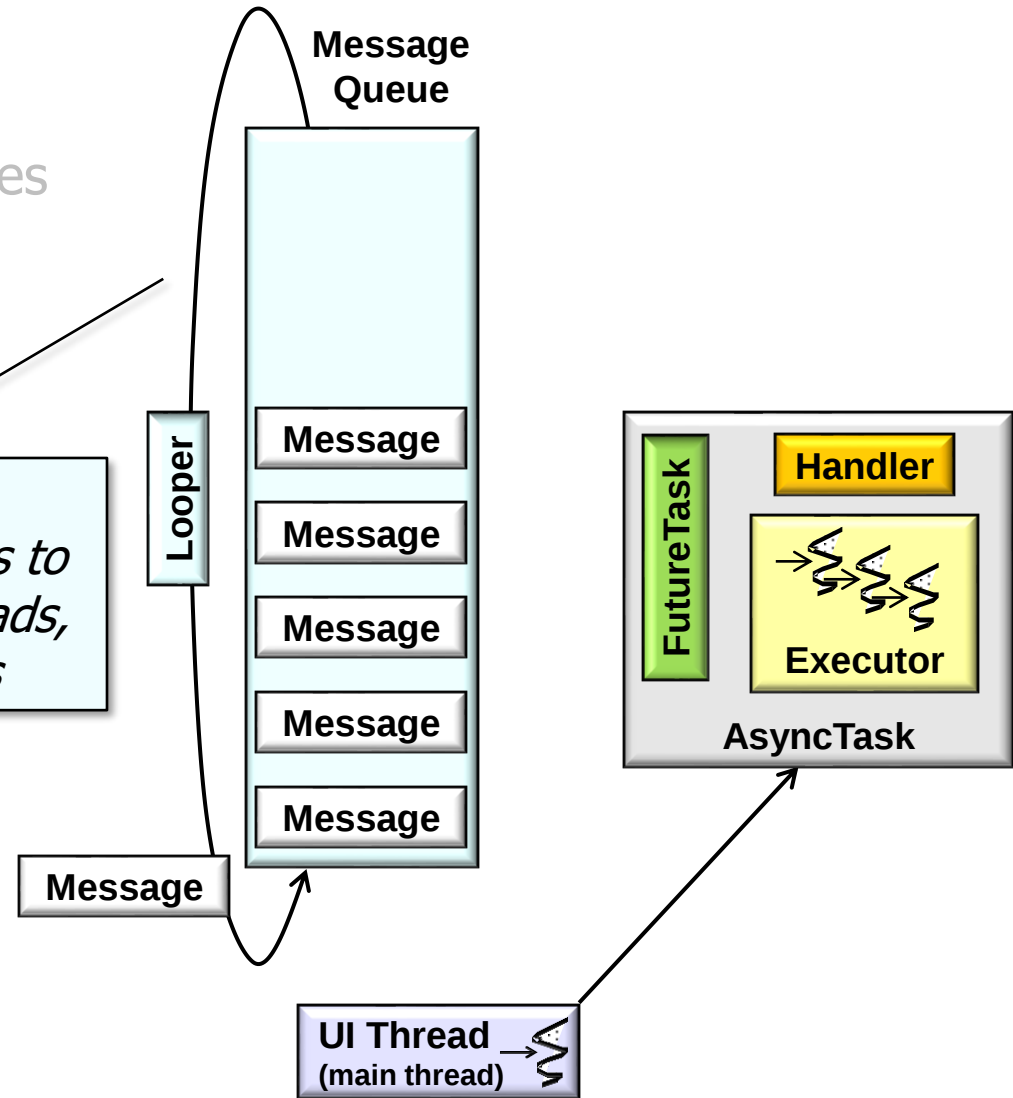


See developer.android.com/training/multiple-threads/communicate-ui.html

Overview of Android Concurrency Frameworks

- Android defines two primary concurrency frameworks
 - Handlers, Messages, & Runnables (HaMeR)
 - AsyncTask

Operations run in one or more background threads & publish results to UI thread without manipulating threads, handlers, messages, or runnables



See developer.android.com/reference/android/os/AsyncTask.html

Overview of Android Concurrency Frameworks

- Both frameworks have pros & cons & are used extensively throughout Android

	Async Task	Posting Runnables	Sending Messages
Usability (Simple)	+++	+++	++
Usability (Complex)	+++	+	++
Scalability	+++	+	+
Flexibility	++	+	+++
Efficiency	++	+++	+++

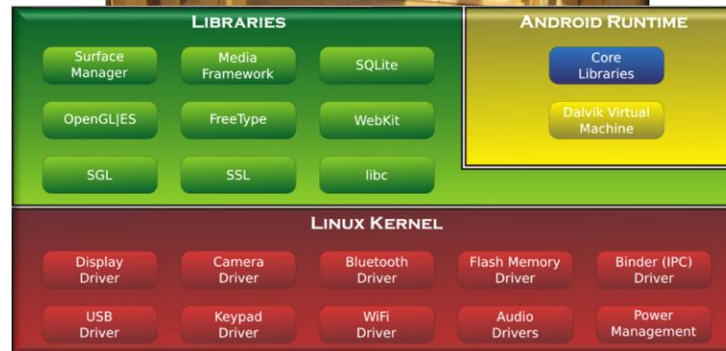
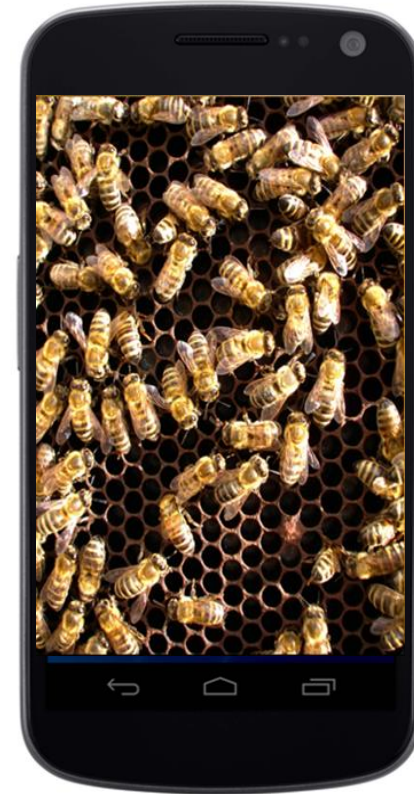
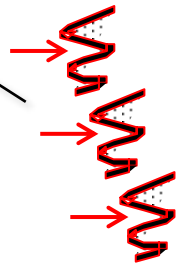


See upcoming part on “*Evaluating Android’s Concurrency Frameworks*”

Overview of Android Concurrency Frameworks

- Android's concurrency frameworks are often used to decouple user interactions from computation & communication

Long-duration & (potentially) blocking operations run in background thread(s)



Overview of Android Concurrency Frameworks

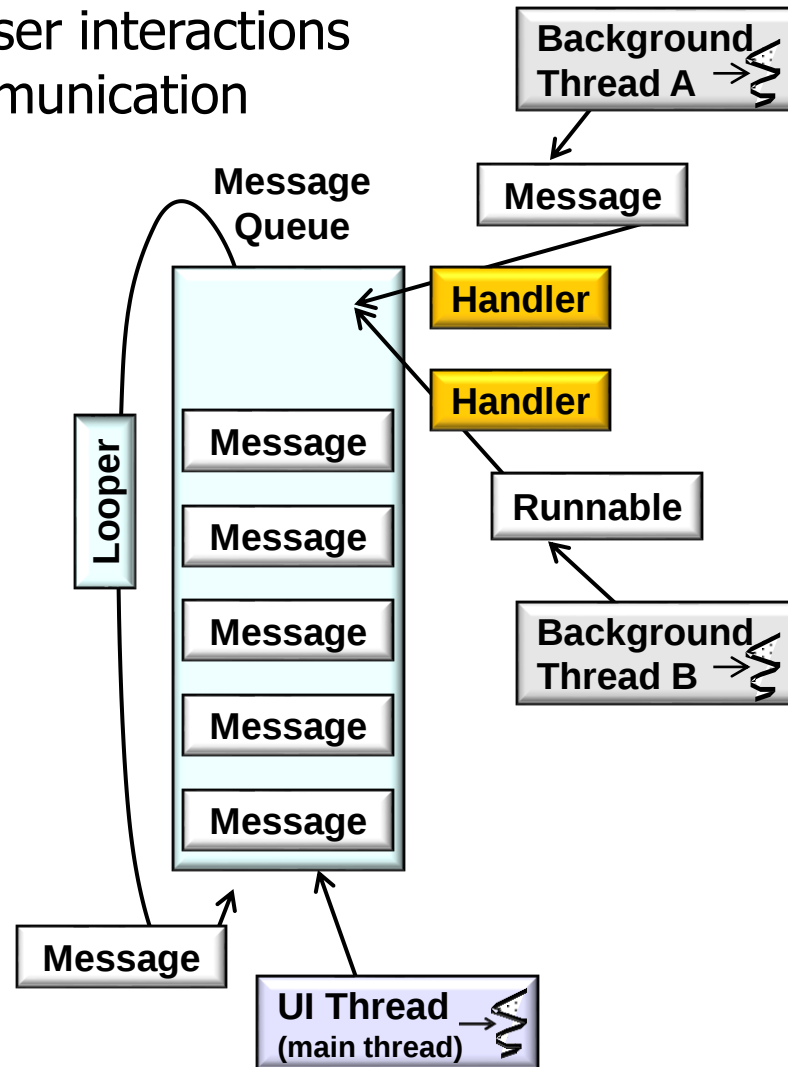
- Android's concurrency frameworks are often used to decouple user interactions from computation & communication

Short-duration, user-facing operations run in the UI thread



Overview of Android Concurrency Frameworks

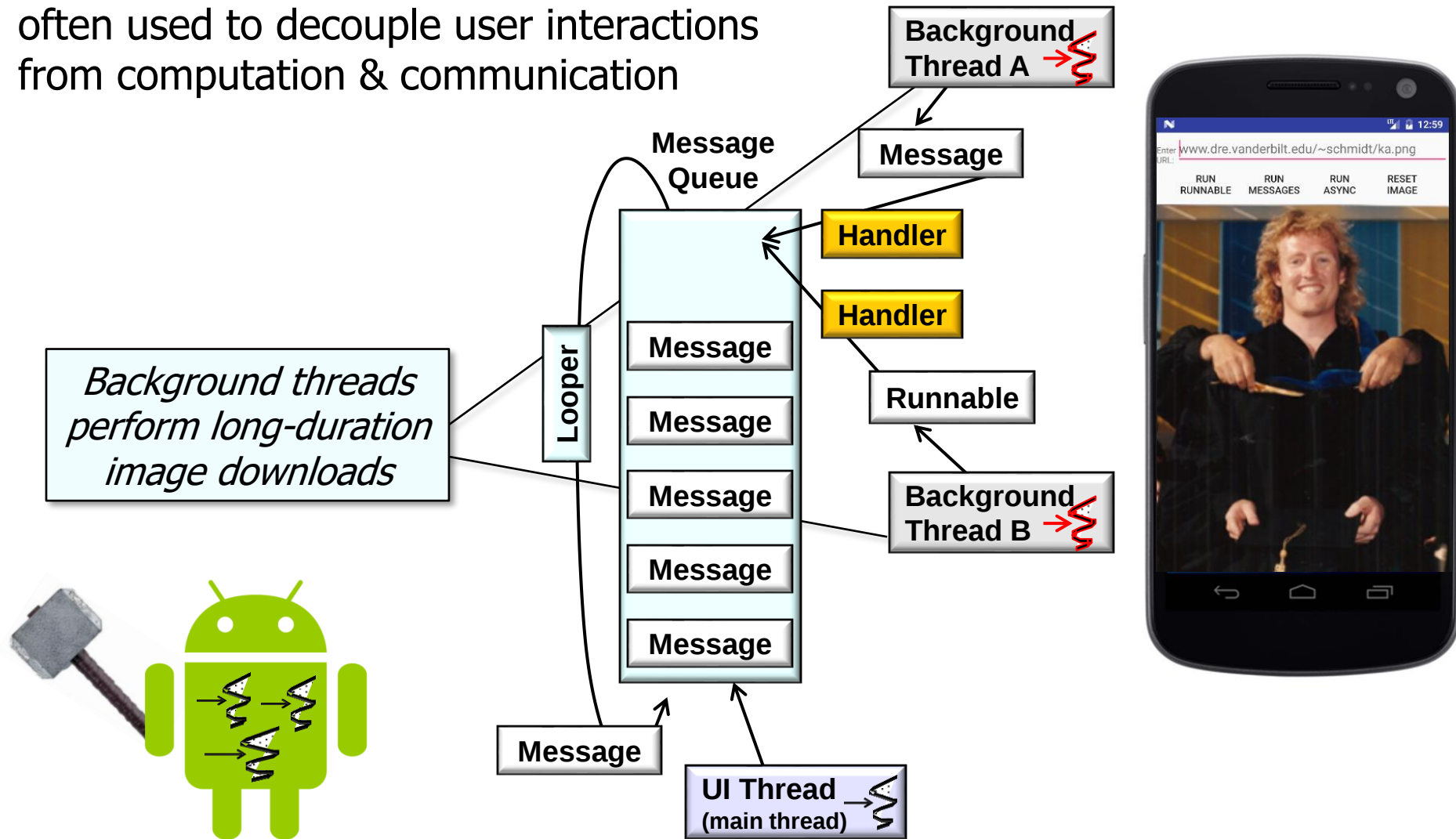
- Android's concurrency frameworks are often used to decouple user interactions from computation & communication



See github.com/douglasraigschmidt/POSA/tree/master/ex/M4/SimpleImageDownloads

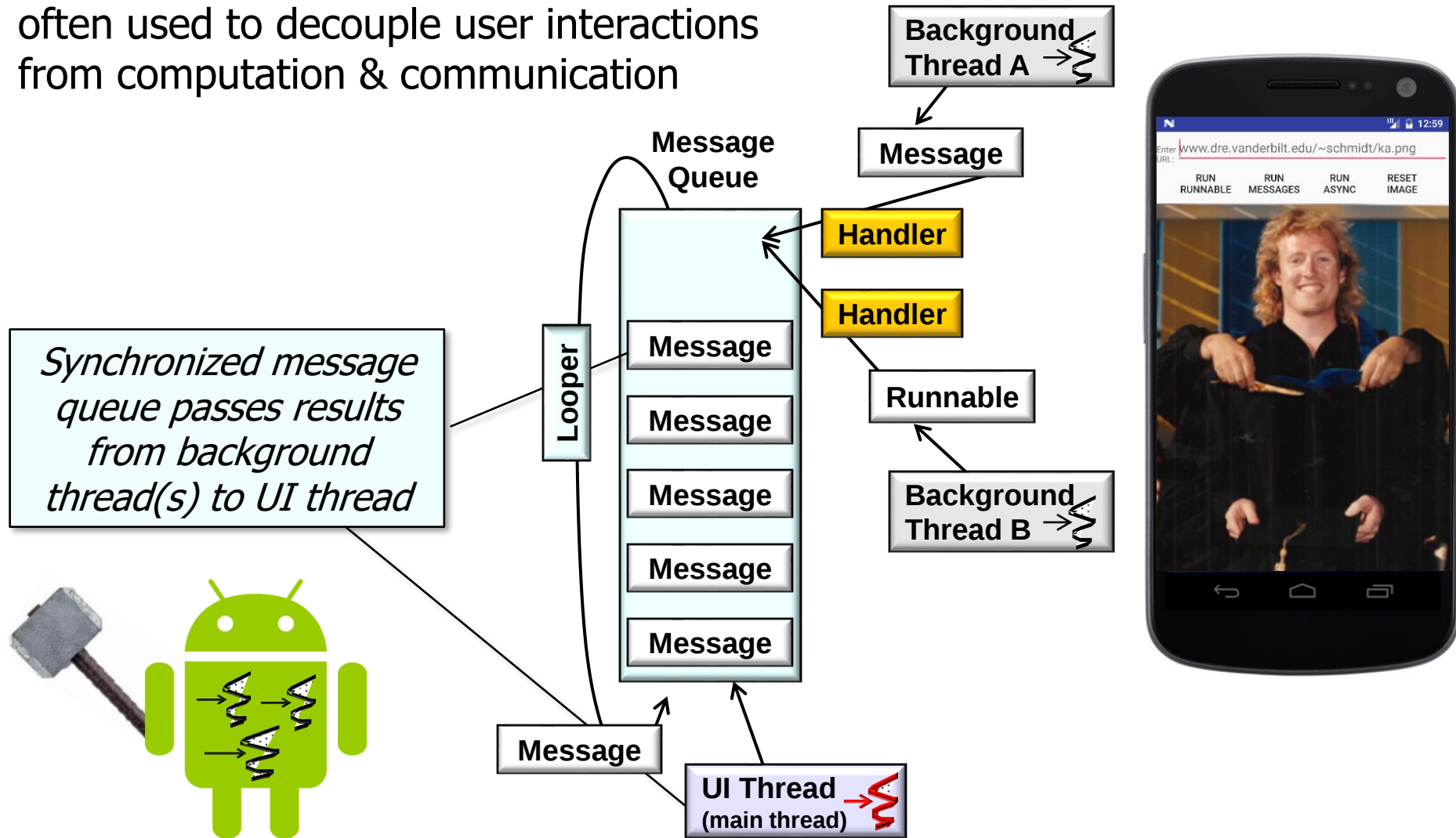
Overview of Android Concurrency Frameworks

- Android's concurrency frameworks are often used to decouple user interactions from computation & communication



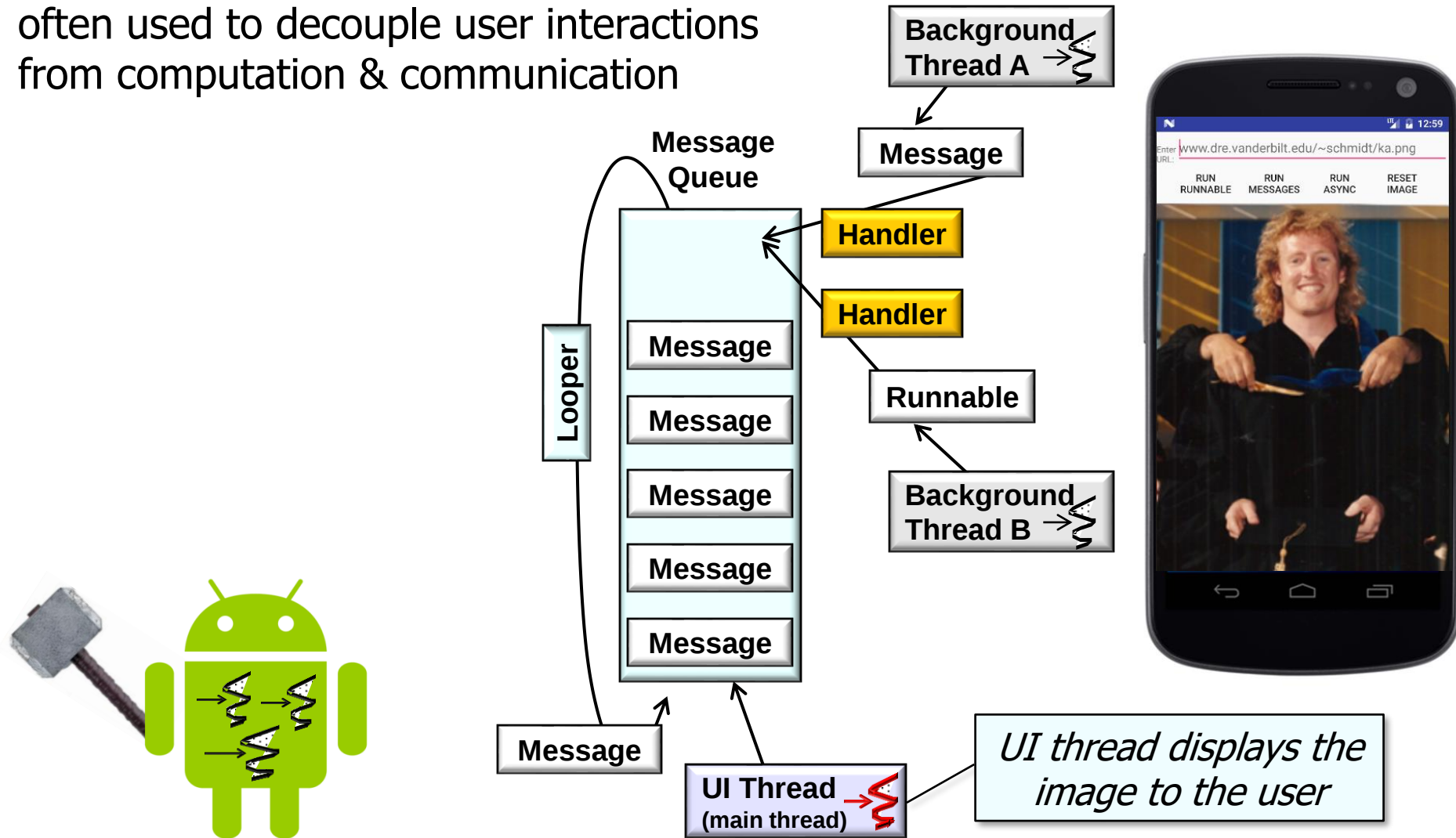
Overview of Android Concurrency Frameworks

- Android's concurrency frameworks are often used to decouple user interactions from computation & communication



Overview of Android Concurrency Frameworks

- Android's concurrency frameworks are often used to decouple user interactions from computation & communication



End of Android Concurrency Frameworks: Introduction