

Read Free
Programming The
Arm
Microprocessor
For Embedded
Systems

Programming The Arm Micr oprocessor For Embedded Systems

**To write
programs for Arm
microcontrollers,
you need to know**

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Programming The

**Arm
Microprocessor
For Embedded
Systems**
**both Assembly
and C languages.
The book covers
Assembly
language
programming for
Cortex-M series
using Thumb-2.
Now, most of the
Arm
Microcontrollers
use the Thumb-2
instruction set.**

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**The ARM
Thumb-2
Assembly
language is
standard
regardless of who
makes the chip.
However, the
ARM licensees
are free to
implement the on-
chip peripheral
(ADC, Timers,**

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**I/O, etc.) as they
choose. Since the
ARM peripherals
are not standard
among the
various vendors,
we have
dedicated a
separate book to
each vendor.**

**Some of them
are: TI Tiva ARM
Programming For**

Read Free
Programming The

**Embedded
Systems:
Programming
ARM Cortex-M4
TM4C123G with
C (Mazidi &
Naimi Arm
Series) TI MSP432
ARM
Programming for
Embedded
Systems (Mazidi
& Naimi Arm**

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Programming The

Series) The

STM32F103 Arm

Microcontroller

and Embedded

Systems: Using

Assembly and C

(Mazidi & Naimi

Arm

Series) STM32

Arm

Programming for

Embedded

Systems Atmel

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Arm
ARM

**Microprocessor
For Embedded
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**For more
information see
the following
websites: www.NicerLand.com
www.MicroDigitalEd.com**

**This user's guide
does far more
than simply**

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**Arm
Microprocessor
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outline the ARM
Cortex-M3 CPU
features; it
explains step-by-
step how to
program and
implement the
processor in real-
world designs. It
teaches readers
how to utilize the
complete and
thumb

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**instruction sets
in order to obtain
the best
functionality,
efficiency, and
reuseability. The
author, an ARM
engineer who
helped develop
the core, provides
many examples
and diagrams
that aid**

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**understanding.
Quick reference
appendices make
locating specific
details a snap!
Whole chapters
are dedicated to:
Debugging using
the new
CoreSight
technology
Migrating
effectively from**

Read Free
Programming The
Arm
**the ARM7 The
Memory
Protection Unit
Interfaces, Except
ions, Interrupts
...and much
more! The only
available guide to
programming and
using the
groundbreaking
ARM Cortex-M3
processor Easy-to-**

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Arm
Microprocessor
For Embedded
Systems
**understand
examples,
diagrams, quick
reference**

**appendices, full
instruction and
Thumb-2**

**instruction sets
are included T
teaches end users
how to start from
the ground up
with the M3, and**

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**how to migrate
from the ARM7
ARM
Microprocessor
SystemsCortex-M
Architecture,
Programming,
and
InterfacingCRC
Press**

**Why Atmel ARM?
The AVR is the
most popular**

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**8-bit
microcontroller
designed and
marketed by the
Atmel (now part
of Microchip).
Due to the
popularity of
ARM
architecture,
many
semiconductor
design companies**

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Arm
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Systems
**are adopting the
ARM as the CPU
of choice in all
their designs.**

**This is the case
with Atmel ARM.
The Atmel SAM D
is a Cortex M0+
chip. A major
feature of the
Atmel SAM D is
its lower power
consumption**

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**which makes it an
ideal
microcontroller
for use in
designing low
power devices
with IoT. It is an
attempt to "bring
Atmel AVR Ease-
of-Use to ARM
Cortex M0+
Based
Microcontrollers.**

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**" Why this book?
We have a very
popular AVR book
widely used by
many
universities. This
book attempts to
help students and
practicing
engineers to
move from AVR
to ARM
programming. It**

Read Free
Programming The
Arm
shows

**programming for
interfacing of**

Atmel ARM SAM

D to LCD, Serial

COM port, DC

motor, stepper

motor, sensors,

and graphics

LCD. It also

covers the

detailed

programming of

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**Arm
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**Interrupts, ADC,
DAC, and Timer
features of Atmel
ARM SAM D21
chip. All the
programs in this
book are tested
using the SAM
D21 trainer board
with Keil and
Atmel Studio IDE
compiler. It must
be noted that**

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**while Arduino
Uno uses the
Atmel 8-bit AVR
microcontroller,
the Arduino Zero
uses the Atmel
ARM SAMD21
chip. See our
website: [www.Mic
roDigitalEd.com](http://www.MicroDigitalEd.com)
Designing and
Optimizing
System Software**

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**Arm System-On-
Chip**

Architecture, 2/E

Atmel Arm

**Programming for
Embedded**

Systems

Practical

Development

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**Throughout the
Evolution of
Windows, The
ARM Cortex-M3
and Cortex-M4
Assembly
Language
Programming**

Learn to
program the
Raspberry Pi
Pico's dual

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Arm
ARM Cortex M0+
Microprocessor
CPUs in
For Embedded
Assembly
Systems

Language. The
Pico contains
a customer
System on a
Chip (SoC)
called the
RP2040, making
it the
Foundation's

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first entry
into the low-
cost microcont
roller market.

The RP2040
contains a
wealth of
coprocessors
for performing
arithmetic as
well as
performing

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Arm
specialized
Microprocessor
I/O
For Embedded
Systems
functionality.

This book will
show you how
these CPUs
work from a
low level,
easy-to-learn
perspective.
There are
eight new

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Arm
Programmable
Microprocessor
I/O (PIO)
For Embedded
Systems
coprocessors
that have
their own
specialized
Assembly
Language
supporting a
wide variety
of interface
protocols.

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You'll explore
these
protocols and
write programs
or functions
in Assembly
Language and
interface to
all the
various
bundled
hardware

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Arm
interfaces.

Microprocessor
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Systems
Then go beyond
working on

your own board

and projects

to contribute

to the

official

RP2040 SDK.

Finally,

you'll take

your DIY

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Arm
hardware
Microprocessor
projects to
For Embedded
Systems
the next level
of performance
and
functionality
with more
advanced
programming
skills. What
You'll Learn
Read and

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Arm
Microprocessor
For Embedded
Systems
understand the
Assembly
Language code
that is part
of the Pico's
SDK Integrate
Assembly
Language and C
code together
into one
program
Interface to

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Arm
available
Microprocessor
options for
For Embedded
DIY
Systems
electronics

and IoT
projects Who
This Book Is
For Makers who
have already
worked with mi
crocontrollers
, such as the

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Arm
Microprocessor
Pico,
For Embedded
Systems
Arduino or
programming in
C or Python.

Those
interested in
going deeper
and learning
how these
devices work
at a lower
level, by

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Arm
Microprocessor
For Embedded
Systems

learning
Assembly
Language.

About the
Raspberry Pi:
Raspberry Pi
boards are low
cost yet
powerful
boards using
Arm
processors.

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Microprocessor
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They can be used for both educational and industrial purposes. About this book:

This book covers Arm Assembly programming for Raspberry Pi boards.

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Arm
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Although the
Arm
instructions
are standard,
the assembler
directives
vary in GCC
and non-GCC
assemblers. In
this book, you
learn how to
write Arm

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Programming The
Arm
assembly
Microprocessor
programs in
For Embedded
Systems
Linux and the
GCC based

compilers.

This book also
gives you a
general view
of the Arm and
Raspberry Pi a
rchitecture.If
you are using

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Arm
Microprocessor
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this book for
a university
course, the
source code,

tutorials,

Power Points

and other

support

materials are

available on

our website: w

ww.NicerLand.c

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omHere is the
table of
contents:

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For Embedded
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Logic

Instructions
and Programs

Chapter 4:
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and Looping in
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Numbers

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and Stack

Chapter 7: ARM
Pipeline and
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Chapter 8: ARM
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Instructions

Chapter 9: ARM

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Chapter 11:

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Appendix D:
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Appendix E:
Passing
Arguments into
Functions We
also have a

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book on
writing Arm
Assembly
Systems

Programs for
non-GCC
compilers
entitled "ARM
Assembly
Language
Programming &
Architecture"
which covers

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Microprocessor
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Arm assembly
language
programming
for Keil and
other non-GNU
IDEs.

This book
provides a
hands-on
approach to
learning ARM
assembly

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language with
the use of a
TI microcontro
ller. The book

starts with an
introduction
to computer
architecture
and then
discusses
number systems
and digital

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logic. The
text covers
ARM Assembly
Language, ARM

Cortex

Architecture

and its

components,

and Hardware

Experiments

using

TILM3S1968.

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Written for
those
interested in
learning
embedded
programming
using an ARM M
icrocontroller

.

Over the last
ten years, the
ARM

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For Embedded
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architecture
has become one
of the most
pervasive
architectures
in the world,
with more than
2 billion ARM-
based
processors
embedded in
products

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ranging from
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cell phones to
For Embedded
automotive
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braking
systems. A
world-wide
community of
ARM developers
in
semiconductor
and product
design

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companies
includes
software
developers,
system
designers and
hardware
engineers. To
date no book
has directly
addressed
their need to

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develop the system and software for an ARM-based system. This text fills that gap. This book provides a comprehensive description of the operation

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of the ARM
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core from a
developer's
perspective
with a clear
emphasis on
software. It
demonstrates
not only how
to write
efficient ARM
software in C

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and assembly
but also how
to optimize
code. Example
code
throughout the
book can be
integrated
into
commercial
products or
used as

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templates to
enable quick
creation of
productive
software. The
book covers
both the ARM
and Thumb
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sets, covers
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Processors,

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outlines
distinctions
among the
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the ARM
architecture,
demonstrates
how to
implement DSP
algorithms,
explains
exception and

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interrupt
handling,
describes the
cache

technologies
that surround
the ARM cores
as well as the
most efficient
memory
management
techniques. A

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final chapter
looks forward
to the future
of the ARM
architecture
considering
ARMv6, the
latest change
to the
instruction
set, which has
been designed

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to improve the
Microprocessor
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DSP and media
processing
capabilities
of the
architecture.

* No other
book describes
the ARM core
from a system
and software
perspective. *

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Author team
Microprocessor
combines
For Embedded
extensive ARM
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software

engineering

experience

with an in-

depth

knowledge of

ARM developer

needs. *

Practical,

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Experiments
Guide to RISC
Processors

A Practical
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Arm Assembly

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The Definitive
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Cortex®-M3 and
Cortex®-M4
Processors
Details RISC

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principles as
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well as explains
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the differences
between this and
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acquire hands-on
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programming
experience
This book
introduces basic

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in assembly
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embedded system
design. It
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assembly
instruction
syntax,
implementing
basic controls

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of C language at
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the assembly
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level, and
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instruction
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many advanced
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software and
hardware
interrupts,

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general purpose
I/O, LCD driver,
keypad
interaction,
real-time clock,
stepper motor
control, PWM
input and
output, digital
input capture,
direct memory
access (DMA),
digital and
analog

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conversion, and
serial

communication

(USART, I2C,
SPI, and USB) .

This book covers
the peripheral
programming of
the STM32 Arm
chip. Throughout
this book, we
use C language
to program the
STM32F4xx chip

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peripherals such
as I/O ports,
ADCs, Timers,
DACs, SPIs, I2Cs
and UARTs. We
use STM32F446RE
NUCLEO
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Cortex(R) -M4
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materials for
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The Designer's
Guide to the
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is a tutorial-
based book
giving the key
concepts
required to
develop programs
in C with a
Cortex M- based

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processor. The
Microprocessor
book begins with
For Embedded
Systems
an overview of
the Cortex- M
family, giving
architectural
descriptions
supported with
practical
examples,
enabling the
engineer to
easily develop
basic C programs

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to run on the
Cortex-
M0/M0+/M3 and
M4. It then
examines the
more advanced
features of the
Cortex
architecture
such as memory
protection,
operating modes
and dual stack
operation. Once

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a firm grounding
in the Cortex M
processor has
been established
the book

introduces the
use of a small
footprint RTOS
and the CMSIS
DSP library.

With this book
you will learn:
The key
differences

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between the
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and M4 How to

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to run on Cortex-
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to do RTOS

development The
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operating modes

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cortex M4 and
how to build
real time DSP
systems An

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standard
(CMSIS), a
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for all Cortex
M- based
microcontrollers
Coverage of the
CMSIS DSP
library for

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Cortex M3 and M4
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tool chain IDE
and debugger
which allows the
accompanying
example projects
to be run in
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the PC or on low
cost hardware
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Coding
The Definitive

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Arm Cortex-M
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and RISC-V
architectures
and the design
of smartphones,
PCs, and cloud

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servers

A Tutorial
Approach

ARM Controller

ARM 64-Bit

Assembly

Language

carefully explains
the concepts of
assembly language
programming,
slowly building

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from simple
examples towards
complex
programming on
bare-metal
embedded
systems.

Considerable
emphasis is put on
showing how to
develop good,
structured

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assembly code.
More advanced
topics such as
fixed and floating
point
mathematics,
optimization and
the ARM VFP and
NEON extensions
are also covered.
This book will help
readers

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understand
representations of,
and arithmetic
operations on,
integral and real
numbers in any
base, giving them
a basic
understanding of
processor
architectures,
instruction sets,

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and more. This resource provides an ideal introduction to the principles of 64-bit ARM assembly programming for both the professional engineer and computer

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engineering student, as well as the dedicated hobbyist with a 64-bit ARM-based computer.

Represents the first true 64-bit ARM textbook
Covers advanced topics such as fixed and floating

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Microprocessor
mathematics,
For Embedded
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optimization and
ARM NEON Uses
standard, free
open-source tools
rather than
expensive
proprietary tools
Provides concepts
that are illustrated
and reinforced

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with a large
number of tested
and debugged
assembly and C

source listings

A practical Wrox

guide to ARM

programming for

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With more than

90 percent of

mobile phones

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sold in recent years using ARM-based processors, developers are eager to master this embedded technology. If you know the basics of C programming, this guide will ease you into the world of embedded ARM

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Arm
technology.

With clear
explanations of
the systems
common to all
ARM processors
and step-by-step
instructions for
creating an
embedded
application,
it prepares you for

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this popular specialty. While ARM technology is not new, existing books on the topic predate the current explosive growth of mobile devices using ARM and don't cover these all-important aspects.

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Newcomers to embedded technology will find this guide approachable and easy to understand. Covers the tools required, assembly and debugging techniques, Optimizations, and more Lists the tools needed for

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various types of
projects
and explores the
details of the
assembly language
Examines the
optimizations that
can be made to
ensure fastcode
Provides step-by-
step instructions
for a basic

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application
and shows how to
build upon it

Professional
Embedded ARM
Development

prepares you
to enter this
exciting and in-
demand

programming
field.

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Mastering ARM hardware architecture opens a world of programming for nearly all phones and tablets including the iPhone/iPad and most Android phones. It ' s also the heart of many

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Arm
single board
Microprocessor
computers like the
For Embedded
Raspberry Pi. Gain
Systems
the skills required
to dive into the
fundamentals of
the ARM hardware
architecture with
this book and start
your own projects
while you develop
a working

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knowledge of
assembly language
for the ARM 64-bit
processor. You'll
review assembly
language
programming for
the ARM
Processor in
64-bit mode and
write programs for
a number of single

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Systems
board computers,
including the
Nvidia Jetson
Nano and the
Raspberry Pi
(running 64-bit
Linux). The book
also discusses how
to target assembly
language
programs for
Apple iPhones and

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iPads along with
64-Bit ARM based
Android phones
and tablets. It
covers all the tools
you require, the
basics of the ARM
hardware
architecture, all
the groups of ARM
64-Bit Assembly
instructions, and

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how data is stored in the computer's memory. In addition, interface apps to hardware such as the Raspberry Pi's GPIO ports. The book covers code optimization, as well as how to

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inter-operate with
C and Python
code. Readers will

develop enough
background to use
the official ARM
reference

documentation for
their own projects.
With

Programming with
64-Bit ARM

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Language as your
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guide you 'll
study how to read,
reverse engineer
and hack machine
code, then be able
to apply these new
skills to study
code examples and
take control of
both your ARM

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devices ' hardware and software. What You'll Learn Make operating system calls from assembly language and include other software libraries in your projects Interface apps to hardware devices

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such as the
Raspberry Pi GPIO
ports Reverse

engineer and hack
code Use the
official ARM
reference

documentation for
your own projects

Who This Book Is
For Software
developers who

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have already
learned to
program in a
higher-level
language like
Python, Java, C#,
or even C and now
wish to learn
Assembly
programming.
Modern Assembly
Language

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Programming The
Arm
Microprocessor
For Embedded
Systems

Programming with
the ARM
Processor is a
tutorial-based
book on assembly
language
programming
using the ARM
processor. It
presents the
concepts of
assembly language

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programming in
different ways,
slowly building
from simple
examples towards
complex
programming on
bare-metal
embedded
systems. The ARM
processor was
chosen as it has

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fewer instructions
and irregular
addressing rules to
learn than most

other

architectures,

allowing more

time to spend on

teaching assembly

language

programming

concepts and good

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programming practice. In this textbook, careful consideration is given to topics that students struggle to grasp, such as registers vs. memory and the relationship between pointers and addresses,

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recursion, and non-integral binary mathematics. A whole chapter is dedicated to structured programming principles.

Concepts are illustrated and reinforced with a large number of

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tested and
debugged
assembly and C
source listings.

The book also
covers advanced
topics such as
fixed and floating
point
mathematics,
optimization, and
the ARM VFP and

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NEON™

Microprocessor

extensions.

PowerPoint slides
For Embedded
Systems

and a solutions

manual are

included. This

book will appeal to

professional

embedded systems

engineers, as well

as computer

engineering

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students taking a
course in assembly
language using the
ARM processor.

Concepts are
illustrated and
reinforced with a
large number of
tested and
debugged
assembly and C
source listing

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Intended for use on very low-cost platforms, such as the Raspberry Pi or pcDuino, but with the support of a full Linux operating system and development tools Includes discussions of advanced topics,

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Systems

such as fixed and
floating point
mathematics,

optimization, and
the ARM VFP and
NEON extensions

Raspberry Pi
Assembly

Language

Programming

Modern Assembly

Language

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Systems
Single Board
Computer
Development for
Raspberry Pi and
Mobile Devices
Definitive Guide to
Arm Cortex-M23
and Cortex-M33
Processors

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For Embedded
Systems
Assembly
Language

Programming

This user's guide does far more than simply outline the ARM Cortex-M3 CPU features; it explains step-by-step how to program and

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implement the processor in real-world designs. It teaches readers how to utilize the complete and thumb instruction sets in order to obtain the best functionality, efficiency, and reuseability. The author, an ARM engineer who

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helped develop the
core, provides
many examples
and diagrams that
aid understanding.

Quick reference
appendices make
locating specific
details a snap!

Whole chapters are
dedicated to:

Debugging using
the new CoreSight
technology

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The Memory
Protection Unit
Interfaces, Excepti
ons, Interrupts
...and much more!
*The only available
guide to
programming and
using the
groundbreaking
ARM Cortex-M3
processor *Easy-to-

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Arm
understand
examples,
diagrams, quick
reference

appendices, full
instruction and
Thumb-2

instruction sets are
all included *The
author, an ARM
engineer on the
M3 development
team, teaches end
users how to start

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from the ground
up with the M3,
and how to migrate
from the ARM7
The Definitive
Guide to the ARM
Cortex-M0 is a
guide for users of
ARM Cortex-M0
microcontrollers. It
presents many
examples to make
it easy for novice
embedded-

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software
Microprocessor
developers to use
the full 32-bit ARM
Cortex-M0
Systems
processor. It
provides an
overview of ARM
and ARM
processors and
discusses the
benefits of ARM
Cortex-M0 over
8-bit or 16-bit
devices in terms of

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energy efficiency,
code density, and
ease of use, as well
as their features
and applications.
The book describes
the architecture of
the Cortex-M0
processor and the
programmers
model, as well as
Cortex-M0
programming and
instruction set and

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how these instructions are used to carry out various operations.

Furthermore, it considers how the memory architecture of the Cortex-M0 processor affects software development;

Nested Vectored Interrupt

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Controller (NVIC) and the features it supports, including flexible interrupt management, nested interrupt support, vectored exception entry, and interrupt masking; and Cortex-M0 features that target the embedded operating system.

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It also explains
how to develop
simple applications
on the Cortex-M0,
how to program
the Cortex-M0
microcontrollers in
assembly and
mixed-assembly
languages, and
how the low-power
features of the
Cortex-M0
processor are used

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in programming.
Finally, it
describes a
number of ARM
Cortex-M0
products, such as
microcontrollers,
development
boards, starter
kits, and
development
suites. This book
will be useful to
both new and

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advanced users of
ARM Cortex
devices, from
students and
hobbyists to
researchers,
professional
embedded-
software
developers,
electronic
enthusiasts, and
even
semiconductor

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product designers.
The first and
definitive book on
the new ARM
Cortex-M0
architecture
targeting the large
8-bit and 16-bit
microcontroller
market Explains
the Cortex-M0
architecture and
how to program it
using practical

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Systems
examples Written
by an engineer at
ARM who was
heavily involved in
its development

Now in its 2nd
edition, this
textbook has been
updated on a new
development board
from

STMicroelectronics
- the Arm Cortex-
M0+ based Nucleo-

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F091RC. Designed
to be used in a
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introductory
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systems.

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the leading
authorities in the
field, this guide
offers readers the
knowledge and

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skills needed to
achieve proficiency
with embedded
software.

Stm32 Arm
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ARM System
Developer's Guide
ARM Cortex-M3:
Arm Cortex M3
Instruction Set
Cortex-M

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Cortex®-M
Processors
The Definitive
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Cortex®-M0 and
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Processors

***A no-nonsense,
practical guide to***

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**current and
future processor
and computer
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enabling you to
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across a variety
of domains Key F
eaturesUndersta**

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**of modern
devices such as
the iPhone X and
high-performance
gaming PCs**
**Book
Description Are
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overwhelmed by
their complexity?
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systems work,
from the lowest
level of transistor**

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macro view of
collaborating
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servers. You'll
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that execute the
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in high-level
languages and***

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efficient and
scalable software
systems. The
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systems including
transistors, logic
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logic, and***

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operations. You
will learn details
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see how to
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likely to take.
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*helpful but not
required.*

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the basic
concepts and
principles of
operating
systems, showing
how to apply
them to the
design and
implementation
of complete*

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information on
ARM
architecture,
ARM instructions
and**

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function call
conventions, run-
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techniques. For
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systems, the
author examines
the ARM MPcore
processors, which
include the SCU
and GIC for
interrupts
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demonstrate the
design principles**

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use TM4C123G
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**Who uses ARM?
Currently ARM
CPU is licensed
and produced by
more than 200
companies and is
the dominant**

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CPU chip in both cell phones and tablets. Given its RISC architecture and powerful 32-bit instructions set, it can be used for both 8-bit and 32-bit embedded products. The ARM corp. has already defined

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**the 64-bit
instruction
extension and for
that reason many
Laptop and
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manufactures are
introducing ARM-
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the **Assembly****

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**language
programming of
the ARM chip.**

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Assembly
language is
standard
regardless of who
makes the chip.**

**The ARM
licensees are free
to implement the
on-chip**

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*ARM peripheral (ADC,
Timers, I/O, etc.)
as they choose.*

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peripherals are
not standard
among the
various vendors,
we have
dedicated a
separate book to
each vendor.*

ARM Cortex-M3

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About the ARM
Architecture The ARM
architecture is the
industry's leading
16/32-bit embedded
RISC processor
solution. ARM
Powered

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microprocessors are being routinely designed into a wider range of products than any other 32-bit processor. This wide applicability is made possible by the ARM architecture, resulting in optimal system solutions at the crossroads of high performance, low power consumption

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and low cost. About
the book This is the
authoritative
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architects that are
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contains detailed
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cache functions, as
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code examples. 0201
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Embedded Systems:
ARM Programming
and Optimization
combines an
exploration of the
ARM architecture with
an examination of the

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facilities offered by the Linux operating system to explain how various features of program design can influence processor performance. It demonstrates methods by which a programmer can optimize program code in a way that does not impact its behavior but improves

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its performance.

Several applications, including image transformations, fractal generation, image convolution, and computer vision tasks, are used to describe and demonstrate these methods. From this, the reader will gain insight into computer architecture and

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application design, as well as gain practical knowledge in the area of embedded software design for modern embedded systems.

Covers three ARM instruction set architectures, the ARMv6 and ARMv7-A, as well as three ARM cores, the ARM11 on the Raspberry Pi, Cortex-

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A9 on the Xilinx Zynq 7020, and Cortex-A15 on the NVIDIA Tegra K1 Describes how to fully leverage the facilities offered by the Linux operating system, including the Linux GCC compiler toolchain and debug tools, performance monitoring support, OpenMP multicore runtime environment,

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video frame buffer,
and video capture
capabilities Designed
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6: Cortex M4

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Chapter 9: DSP
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Chapter 10:

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11: Project Don't
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course, you'll see
everything you
needed to quickly get
started with

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M3/M4 based
controller. The lab
session covers
various programming
assignments which
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started with
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Cortex-M3 & Cortex-
M4 from Today. Buy
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Assembly Language.

When a high-level language compiler processes source code, it generates the assembly language translation of all of the high-level code into a processor's specific set of instructions.

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Projects Using mbed
ARM® Cortex® M4
Cookbook

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ARM designs the cores of microcontrollers which equip most "embedded systems" based on 32-bit processors. Cortex M3 is one of these designs,

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Systems
recently
developed by ARM
with Embedded
microcontroller
applications in
mind. To
conceive a
particularly
optimized piece
of software (as
is often the
case in the
world of
embedded

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systems) it is often necessary to know how to program in an assembly language. This book explains the basics of programming in an assembly language, while being based on the architecture of Cortex M3 in

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detail and
developing many
examples. It is
written for

people who have
never programmed
in an assembly
language and is
thus didactic
and progresses
step by step by
defining the
concepts
necessary to

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acquiring a good understanding of these techniques.

Gain all the skills required to dive into the fundamentals of the Raspberry Pi hardware architecture and how data is stored in the Pi's memory.

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This book provides you with working starting points for your own projects while you develop a working knowledge of Assembly language programming on the Raspberry Pi. You'll learn

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how to interface
to the Pi's
hardware
including

accessing the
GPIO ports. The
book will cover
the basics of
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well as how to
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with C and
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enough

background to

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you'll study how

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to read and
reverse engineer
machine code and
then then apply
those new skills
to study code
examples and
take control of
your Pi's
hardware and
software both.

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language Use the
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For Coders who have already learned to program in a higher-level language like Python, Java, C#, or C and now wish to learn Assembly programming. Why MSP432? The MSP430 is a popular

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designed and marketed by the Texas Instruments (TI). It comes with some powerful peripherals such as ADC, Timer, SPI, I2C, UART, and so on. It has a 16-bit proprietary RISC

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systems. Due to
popularity of
ARM
architecture,
many
semiconductor
design companies
are moving away
from proprietary
architecture and
adopting the ARM

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Systems
as the CPU of
choice in all
their designs.

This is the case
with MSP430. The
MSP432 is an ARM
version of the
MSP430. In other
words, all the
MSP430
peripherals are
moved to MSP432
with ARM
instructions and

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architecture as
the core
processor.

Another major
feature of the
MSP432 is its
lower power
consumption
which makes it
an ideal
microcontroller
for use in
designing low
power devices

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with IoT. See
the link below:

http://www.ti.com/lscs/ti/microcontrollers_16-bit_32-bit/msp/low_power_performance/msp432p4x/overview.page Why this book? While there are several MSP430 textbooks on the market,

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currently there
is only one
textbook for

MSP432. This
textbook covers
the details of
the MSP432
peripherals such
as ADC, Timer,
SPI, I2C and so
on with ARM
programs. It
also includes
the programs for

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interfacing of
MSP432 to LCD,
Serial COM port,
DC motor,
stepper motor,
sensors, and
graphics LCD.

All the programs
in the book are
tested using the
MSP432 LaunchPad
trainer board
from TI. See the
link below:

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[http://www.ti.com/tool/MSP-](http://www.ti.com/tool/MSP-EXP432P401R#buy)

[EXP432P401R#buy](http://www.ti.com/tool/MSP-EXP432P401R#buy)

The book

presents the

fundamentals of

ARM processor in

a simple, lucid

and systematic

way. It also

gives

comprehensive

coverage of the

popular ARM

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Arm
microcontroller
- LPC2148. The
book is divided
into two parts.

The first part
focuses on the
RISC design
philosophy, ARM
design
philosophy,
embedded system
hardware,
embedded system
software, ARM

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processor
Microprocessor
fundamentals,
instruction set,
programming,
exceptions and
interrupt
handling
schemes. The
second part
focuses on
LPC2148 CPU, its
features,
architecture,
registers, GPIO,

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Timers,
Microprocessor
Interrupt
controller, PLL
and other
peripherals.

Ti Tiva Arm
Programming for
Embedded Systems
With C and GNU
Development
Tools

Ti Msp432 Arm
Programming for
Embedded Systems

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ARM Architecture
Reference Manual
For Programmers
and Engineers
Old New Thing
The Definitive
Guide to Arm®
Cortex®-M23 and
Cortex-M33
Processors
focuses on the
Armv8-M

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For Embedded
Systems
architecture and
the features that
are available in
the Cortex-M23
and Cortex- M33
processors. This
book covers a
range of topics,
including the
instruction set,
the
programmer's

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model, interrupt
handling, OS
support, and
debug features. It

demonstrates
how to create
software for the
Cortex-M23 and
Cortex-M33
processors by
way of a range of
examples, which

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will enable
embedded
software
developers to
understand the
Armv8-M
architecture. This
book also covers
the TrustZone®
technology in
detail, including
how it benefits

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security in IoT
applications, its
operations, how
the technology

affects the
processor's
hardware (e.g.,
memory
architecture,
interrupt
handling, etc.),
and various other

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Arm
considerations in
Microprocessor
creating secure
For Embedded
software.
Systems

Presents the first
book on Armv8-M
Architecture and
its features as
implemented in
the Cortex-M23
and Cortex-M33
processors
Covers

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TrustZone
Microprocessor
technology in
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detail Includes
examples

showing how to
create software
for Cortex-
M23/M33
processors

This book
presents the use
of a microproces

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processor-based digital
system in our
daily life. Its
bottom-up
approach
ensures that all
the basic building
blocks are
covered before
the development
of a real-life
system. The

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ultimate goal of the book is to equip students with all the fundamental building blocks as well as their integration, allowing them to implement the applications they have dreamed up

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with minimum effort.

This new edition has been fully revised and updated to include extensive information on the ARM Cortex-M4 processor, providing a complete up-to-

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date guide to
both Cortex-M3
and Cortex-M4
processors, and
which enables
migration from
various
processor
architectures to
the exciting world
of the Cortex-M3
and M4. This

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book presents
the background
of the ARM

architecture and
outlines the
features of the
processors such
as the instruction
set, interrupt-
handling and also
demonstrates
how to program

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and utilize the
advanced
features available
such as the

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Protection Unit

(MPU). Chapters

on getting started

with IAR, Keil,

gcc and CooCox

ColDE tools help

beginners

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develop program codes. Coverage also includes the important areas of software development such as using the low power features, handling information input/output,

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projects with
assembly and C,
and other

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features and
CMSIS-DSP
software
libraries,
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and how to write
DSP software for
the Cortex-M4
processor,
including
examples of
using the CMSIS-
DSP library, as
well as useful
information about
the DSP

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capability of the
Cortex-M4
processor A new
chapter on the
Cortex-M4
floating point unit
and how to use it
A new chapter on
using embedded
OS (based on
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well as details of

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processor
features to
support OS
operations

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debugging
techniques as
well as a
troubleshooting
guide in the
appendix topics
on software

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porting from
other
architectures A
full range of easy-
to-understand
examples,
diagrams and
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appendices

The Arm(R)
Cortex(R)-M
processors are

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already one of
the most popular
choices for IoT
and embedded
applications.

With Arm Flexible
Access and
DesignStart(TM),
accessing Arm
Cortex-M
processor IP is
fast, affordable,

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and easy. This book introduces all the key topics that system-on-chip (SoC) and FPGA designers need to know when integrating a Cortex-M processor into their design, including bus

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protocols, bus
interconnect, and
peripheral
designs. Joseph

Yiu is a

distinguished

Arm engineer

who began

designing SoCs

back in 2000 and

has been a leader

in this field for

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nearly twenty years. Joseph's book takes an expert look at what SoC designers need to know when incorporating Cortex-M processors into their systems. He discusses the on-

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chip bus protocol
specifications
Microprocessor
For Embedded
Systems
(AMBA, AHB, and
APB), used by
Arm processors
and a wide range
of on-chip digital
components
such as memory
interfaces,
peripherals, and
debug

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components.

Microprocessor
Software
development and
advanced design
considerations
are also covered.

The journey
concludes with
'Putting the
system together',
a designer's eye
view of a simple

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Microcontroller-
Microprocessor
like design based
For Embedded
Systems
on the Cortex-M3
processor
(DesignStart) that
uses the
components that
you will have
learned to create.
RP2040
Assembly
Language

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Cortex-M3
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Over 50 hands-on recipes that will help you develop amazing real-time

applications using GPIO, RS232, ADC, DAC, timers, audio codecs, graphics LCD, and a touch screen

About This Book This book focuses on

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*programming
embedded systems
using a practical
approach Examples
show how to use
bitmapped graphics
and manipulate
digital audio to
produce amazing
games and other
multimedia
applications The*

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*recipes in this book
are written using*

ARM's MDK

Microcontroller

Development Kit

*which is the most
comprehensive and
accessible*

development

solution Who This

Book Is For This

book is aimed at

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*those with an
interest in designing
and programming
embedded systems.*

*These could include
electrical engineers
or computer
programmers who
want to get started
with microcontroller
applications using
the ARM Cortex-M4*

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*architecture in a
short time frame.*

*The book's recipes
can also be used to
support students
learning embedded
programming for the
first time. Basic
knowledge of
programming using
a high level
language is essential*

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Arm

*but those familiar
with other high level
languages such as*

Python or Java

*should not have too
much difficulty*

*picking up the basics
of embedded C*

*programming. What
You Will Learn Use*

ARM's uVision MDK

to configure the

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*microcontroller run
time environment
(RTE), create
projects and compile
download and run
simple programs on
an evaluation board.
Use and extend
device family packs
to configure I/O
peripherals. Develop
multimedia*

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Arm

*applications using
the touchscreen and
audio codec beep
generator. Configure*

*the codec to stream
digital audio and
design digital filters
to create amazing
audio effects. Write
multi-threaded
programs using
ARM's real time*

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Arm

operating system (RTOS). Write critical sections of code in assembly language and integrate these with functions written in C. Fix problems using ARM's debugging tool to set breakpoints and examine variables.

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Arm
*Port uVision
Microprocessor
projects to other
open source
development*

*environments. In
Detail Embedded
microcontrollers are
at the core of many
everyday electronic
devices. Electronic
automotive systems
rely on these devices*

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*for engine
Microprocessor
management, anti-
lock brakes, in car
Systems
entertainment,*

*automatic
transmission, active
suspension, satellite
navigation, etc. The
so-called internet of
things drives the
market for such
technology, so much*

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*so that embedded
cores now represent*

*90% of all
processor's sold. The*

ARM Cortex-M4 is

one of the most

powerful

microcontrollers on

the market and

includes a floating

point unit (FPU)

which enables it to

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ARM
address
Microprocessor
applications. The
For Embedded
Systems
ARM Cortex-M4
Microcontroller

Cookbook provides a
practical
introduction to
programming an
embedded
microcontroller
architecture. This
book attempts to

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Arm
Microprocessor
For Embedded
Systems
*address this through
a series of recipes
that develop
embedded*

*applications
targeting the ARM-
Cortex M4 device
family. The recipes
in this book have all
been tested using the
Keil*

MCBSTM32F400

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board. This board includes a small graphic LCD touchscreen

(320x240 pixels) that can be used to create a variety of 2D gaming applications. These motivate a younger audience and are used throughout the book

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*to illustrate
particular hardware
peripherals and
software concepts. C*

*language is used
predominantly
throughout but one
chapter is devoted to
recipes involving
assembly language.*

*Programs are mostly
written using ARM's*

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*Arm
Microprocessor
For Embedded
Systems*
*free microcontroller
development kit
(MDK) but for those
looking for open
source development
environments the
book also shows how
to configure the
ARM-GNU
toolchain. Some of
the recipes described
in the book are the*

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basis for
Microprocessor
laboratories and
For Embedded
assignments
Systems

undertaken by
undergraduates.

Style and approach
The ARM Cortex-M4
Cookbook is a
practical guide full
of hands-on recipes.

It follows a step-by-
step approach that

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For Embedded
Systems
*allows you to find,
utilize and learn
ARM concepts
quickly.*

*The Definitive Guide
to the ARM®
Cortex®-M0 and
Cortex-M0+
Processors, Second
Edition explains the
architectures
underneath ARM's*

Page 253/282

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Cortex-M0 and
Cortex-M0+
Microprocessor
For Embedded
Systems
processors and their
programming

*techniques. Written
by ARM's Senior
Embedded
Technology
Manager, Joseph
Yiu, the book is
packed with
examples on how to*

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Systems
*use the features in
the Cortex-M0 and
Cortex-M0+
processors. It*

*provides detailed
information on the
instruction set
architecture, how to
use a number of
popular development
suites, an overview
of the software*

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Systems
*development flow,
and information on
how to locate
problems in the*

*program code and
software porting.*

*This new edition
includes the*

*differences between
the Cortex-M0 and
Cortex-M0+*

processors such as

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Systems

*architectural
features (e.g.
unprivileged
execution level,
vector table
relocation), new
chapters on low
power designs and
the Memory
Protection Unit
(MPU), the benefits
of the Cortex-M0+*

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*processor, such as
the new single cycle
I/O interface, higher
energy efficiency,
better performance
and the Micro Trace
Buffer (MTB)
feature, updated
software
development tools,
updated Real Time
Operating System*

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*examples using
Keil™ RTX with
CMSIS-RTOS APIs,
examples of using*

*various Cortex-M0
and Cortex-M0+
based*

*microcontrollers,
and much more.*

*Provides detailed
information on*

ARM® Cortex®-M0

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Arm
and Cortex-M0+
Microprocessor
Processors,
For Embedded
Systems
*including their
architectures,*

*programming model,
instruction set, and
interrupt handling*
Presents detailed
information on the
differences between
the Cortex-M0 and
Cortex-M0+

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*processors Covers
Microprocessor
software
development flow,
including examples
for various
development tools in
both C and assembly
languages Includes
in-depth coverage of
design approaches
and considerations
for developing ultra*

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Systems
*low power embedded
systems, the
benchmark for
energy efficiency in
microcontrollers,
and examples of
utilizing low power
features in
microcontrollers*
*"Raymond Chen is
the original
raconteur of*

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*Windows." --Scott
Hanselman,
ComputerZen.com*

*"Raymond has been
at Microsoft for
many years and has
seen many nuances
of Windows that
others could only
ever hope to get a
glimpse of. With this
book, Raymond*

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*shares his
knowledge,
experience, and
anecdotal stories,
allowing all of us to
get a better
understanding of the
operating system
that affects millions
of people every day.
This book has
something for*

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everyone, is a casual read, and I highly recommend it!"

*--Jeffrey Richter,
Author/Consultant,
Cofounder of
Wintellect "Very
interesting read.*

*Raymond tells the
inside story of why
Windows is the way
it is." --Eric*

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Gunnerson,
Program Manager,
Microsoft
Systems,
Corporation

"Absolutely essential reading for understanding the history of Windows, its intricacies and quirks, and why they came about." --Matt Pietrek, MSDN

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*Magazine's Under
the Hood Columnist
"Raymond Chen has
become something of
a legend in the
software industry,
and in this book
you'll discover why.
From his high-level
reminiscences on the
design of the
Windows Start*

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button to his low-level discussions of GlobalAlloc that only your inner-geek could love, The Old New Thing is a captivating collection of anecdotes that will help you to truly appreciate the difficulty inherent in

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Systems
*designing and
writing quality
software." --Stephen
Toub, Technical
Editor, MSDN*

*Magazine Why does
Windows work the
way it does? Why is
Shut Down on the
Start menu? (And
why is there a Start
button, anyway?)*

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*How can I tap into
the dialog loop?*

Why does the

GetWindowText

*function behave so
strangely? Why are
registry files called
"hives"? Many of
Windows' quirks
have perfectly
logical explanations,
rooted in history.*

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*Understand them,
and you'll be more
productive and a lot
less frustrated.*

Raymond

*Chen--who's spent
more than a decade
on Microsoft's*

Windows

development

team--reveals the

"hidden Windows"

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*you need to know.
Chen's engaging
style, deep insight,
and thoughtful
humor have made
him one of the
world's premier
technology bloggers.
Here he brings
together behind-the-
scenes explanations,
invaluable technical*

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*advice, and
illuminating
anecdotes that bring
Windows to life--and
help you make the
most of it. A few of
the things you'll find
inside: What vending
machines can teach
you about effective
user interfaces A
deeper*

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*understanding of
window and dialog
management Why
performance*

*optimization can be
so counterintuitive A
peek at the
underbelly of COM
objects and the
Visual C++
compiler Key details
about backwards*

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Windows does and
why Windows
program security*

*holes most
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citizen*

*ARM-based
Microcontroller*

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Systems
*Projects Using mbed
gives readers a good
understanding of the
basic architecture
and programming of
ARM-based
microcontrollers
using ARM's mbed
software. The book
presents the
technology through
a project-based*

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*approach with
clearly structured
sections that enable
readers to use or
modify them for their
application. Sections
include: Project
title, Description of
the project, Aim of
the project, Block
diagram of the
project, Circuit*

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*diagram of the
project,*

Microprocessor
For Embedded
Systems
*Construction of the
project, Program*

listing, and a

Suggestions for

expansion. This book

will be a valuable

resource for

professional

engineers, students

and researchers in

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*computer
engineering,
computer science,
automatic control*

*engineering and
mechatronics.*

*Includes a wide
variety of projects,
such as*

*digital/analog inputs
and outputs (GPIO,
ADC, DAC), serial*

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communications
(UART, I2C, SPI),
WiFi, Bluetooth, DC
and servo motors

Based on the
popular Nucleo-
L476RG
development board,
but can be easily
modified to any
ARM compatible
processor Shows

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*how to develop
robotic applications
for a mobile robot*

*Contains complete
mbed program*

*listings for all the
projects in the book*

*The Designer's
Guide to the Cortex-
M Processor Family
Embedded Systems
with Arm Cortex-M*

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