LEARNING TO PROGRAM WITH VISUAL BASIC AND .NET GADGETEER

A guide to accompany the Fez Cerberus Tinker Kit

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FOREWORD

Computer programming can be fun! This book on Visual Basic and .NET Gadgeteer shows how. Aimed at high school students and first-time programmers, the authors use a combination of hardware and software to make programming come alive - audibly, visually, and tangibly. Using small hardware components - a standalone processor, simple sensors and actuators - students build their own little computers in hardware and then program them to do fun things, such as play music (Chapter 3), blink lights (Chapter 6), or draw pictures (Chapter 10). By the end of the book, students have learned all the basics of programming: variables, basic data types, arrays, conditionals, iteration, procedures, and functions. More importantly, they learn a fundamental "computational thinking" concept - modularity. From the very first exercise, students become engaged through the tactile experience of assembling hardware components together to build real devices which they program through standard interfaces, protocols, and built-in libraries. Without a lot of fuss, the authors teach these concepts using the widely-adopted Visual Studio software development tool, exposing students to a modern programming environment that supports the engineering cycle of design, build, test, and debug. At the same time, students naturally assimilate a better understanding of how electronic devices work and how they are made, valuable skills in our increasingly digital lives.

Jeannette M. Wing
Corporate Vice President, Microsoft Research
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First and foremost we would like to thank our colleagues Clare Morgan and Nicolas Villar: Clare has been instrumental in facilitating school outreach and supporting the team; Nicolas is the original inventor of the platform without whom we would have no .NET Gadgeteer. We have worked with a number of Gadgeteer hardware manufacturers during this project, but we would particularly like to call out GHI Electronics who were excited to explore how Gadgeteer could be used in the classroom from the outset of our work and who tailored a kit of Gadgeteer parts to support the learning points and exercises we wanted to cover. We are extremely grateful to the young people who have spent dedicated time working through the book, testing the exercises, and giving us their invaluable feedback, including: Ellen Curran, Thomas Denney, David and Jonathan Goh, Armin Grosche, Maeve McLaughlin, Alistair Sentance, and Alfie Sharp. Finally, we owe a great deal to the hundreds of students and educators who have embraced Gadgeteer in their classrooms over the past two years. In a world where it is all too easy to become a consumer of digital technologies, we hope that this book will inspire a new generation of digital creators!

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