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Nota di contenuto	Cover -- Table of Contents -- Acknowledgments -- Alexander Koutmos -- Bruce Tate -- Frank Hunleth -- Introduction -- What You Will Build -- How to Read This Book -- Running the Code Exercises -- Online Resources -- 1. Elixir and Nerves for IoT -- Why Nerves for IoT? -- Time-Series Sensor Hub -- Laying Out the Architecture -- Organizing Your Nerves Project -- Assembling the Weather Station -- Your Turn -- 2. Wirelessly Reading Sensor Data -- Creating a Network-Enabled Sensor Hub Project -- Getting on to the Network -- Capturing Sensor Data -- Your Turn -- 3. Aggregating Sensor Data -- Wrapping Sensors in GenServers -- Build the Firmware Project -- Managing the Life Cycle -- Your Turn -- 4. Publishing Sensor Data -- Setting up Docker Compose -- Creating the Phoenix Application -- Publishing Metrics -- Your Turn -- 5. Pulling It All Together -- Adding Grafana to Docker Compose -- Exploring the Data with SQL -- Creating a Weather Dashboard -- Your Turn.
Sommario/riassunto	The Elixir programming language has become a go-to tool for creating reliable, fault-tolerant, and robust server-side applications. Thanks to Nerves, those same exact benefits can be realized in embedded

applications. This book will teach you how to structure, build, and deploy production grade Nerves applications to network-enabled devices. The weather station sensor hub project that you will be embarking upon will show you how to create a full stack IoT solution in record time. You will build everything from the embedded Nerves device to the Phoenix backend and even the Grafana time-series data visualizations. Elixir as a programming language has found its way into many different software domains, largely in part to the rock-solid foundation of the Erlang virtual machine. Thanks to the Nerves framework, Elixir has also found success in the world of embedded systems and IoT. Having access to all of the Elixir and OTP constructs such as concurrency, supervision, and immutability makes for a powerful IoT recipe. Find out how to create fault-tolerant, reliable, and robust embedded applications using the Nerves framework. Build and deploy a production-grade weather station sensor hub using Elixir and Nerves, all while leveraging the best practices established by the Nerves community for structuring and organizing Nerves applications. Capture all of your weather station sensor data using Phoenix and Ecto in a lightweight server-side application. Efficiently store and retrieve the time-series weather data collected by your device using TimescaleDB (the Postgres extension for time-series data). Finally, complete the full stack IoT solution by using Grafana to visualize all of your time-series weather station data. Discover how to create software solutions where the underlying technologies and techniques are applicable to all layers of the project. Take your project from idea to production ready in record time with Elixir and Nerves.

What You Need: To complete the Nerves weather station project in this book, you will need the following:

- A Linux, MacOS, or Windows computer to build and deploy Nerves firmware images
- A Raspberry Pi Zero W or any other Nerves supported target (<https://hexdocs.pm/nerves/targets.html#supported-targets-and-systems>)
- A VEML6030 light sensor
- An BME680 environmental sensor
- An SGP30 air quality sensor
- Qwiic connect cables for weather sensors.
