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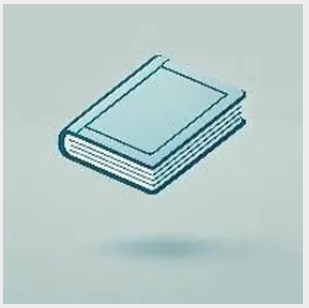
Smart AI-Lens Hardware Prototyping with Micro:bit

Designing Interactive and Engaging Smart Devices



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Smart AI-Lens Hardware Prototyping with Micro:bit: Designing Interactive and Engaging Smart Devices is a practical, hands-on guide for learners, teachers, and makers who want to bring artificial intelligence into real-world projects. Using two affordable tools—the BBC micro:bit microcontroller and the Smart AI-Lens vision camera—readers learn to create functional AI prototypes without expensive hardware or advanced programming experience.The book simplifies AI hardware prototyping through clear, practical steps. The Smart AI-Lens, equipped with a neural processor unit such as the Kendryte K210, performs recognition tasks including face detection, object tracking, and color identification. The micro:bit then uses the AI-Lens output to make decisions and trigger actions such as moving motors, sounding alarms, or displaying information. By separating recognition from control, readers explore how edge-AI devices are structured to sense, decide, and act.As AI becomes part of smart gadgets, robots, and Internet of Things (IoT) devices, this book offers a hands-on alternative to resources focused mainly on software or theory. Step-by-step projects help readers connect AI concepts with working hardware prototypes. Suitable for STEM classrooms, makerspaces, and independent learning, the book makes AI hardware prototyping approachable, engaging, and achievable for beginners and early intermediate learners.What You'll Learn• Prototype AI hardware devices using affordable tools, including the BBC micro:bit and Smart AI-Lens.
• Understand how AI vision sensors and microcontrollers divide recognition, decision-making, and control tasks.
• Build practical AI projects such as smart alarms, robot cars, automated sorters, and connected devices.
• Connect AI concepts with hands-on experience by designing systems that sense, decide, and act.
• Explore AI hardware applications for STEM education, makerspaces, self-learning, and future innovation.Who Is This Book ForThis book is written for learners, educators, hobbyists, and makers interested in practical, low-cost AI hardware projects. No prior experience with AI, computer vision, or machine learning is required. Familiarity with the BBC micro:bit or basic electronics may be helpful but is not essential.

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