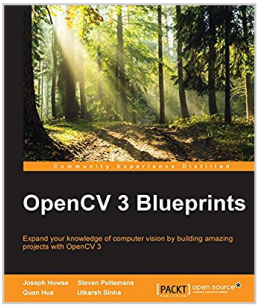

OpenCV 3 Blueprints

By Joseph Howse, Steven Puttemans, Quan Hua, Utkarsh Sinha

OpenCV 3 Blueprints By Joseph Howse, Steven Puttemans, Quan Hua, Utkarsh Sinha

Expand your knowledge of computer vision by building amazing projects with OpenCV 3

About This Book

- Build computer vision projects to capture high-quality image data, detect and track objects, process the actions of humans or animals, and much more
- Discover practical and interesting innovations in computer vision while building atop a mature open-source library, OpenCV 3
- Familiarize yourself with multiple approaches and theories wherever critical decisions need to be made

Who This Book Is For

This book is ideal for you if you aspire to build computer vision systems that are smarter, faster, more complex, and more practical than the competition. This is an advanced book intended for those who already have some experience in setting up an OpenCV development environment and building applications with OpenCV. You should be comfortable with computer vision concepts, object-oriented programming, graphics programming, IDEs, and the command line.

What You Will Learn

- Select and configure camera systems to see invisible light, fast motion, and distant objects
- Build a “camera trap”, as used by nature photographers, and process photos to create beautiful effects
- Develop a facial expression recognition system with various feature extraction techniques and machine learning methods
- Build a panorama Android application using the OpenCV stitching module in C++ with NDK support
- Optimize your object detection model, make it rotation invariant, and apply scene-specific constraints to make it faster and more robust

- Create a person identification and registration system based on biometric properties of that person, such as their fingerprint, iris, and face
- Fuse data from videos and gyroscopes to stabilize videos shot from your mobile phone and create hyperlapse style videos

In Detail

Computer vision is becoming accessible to a large audience of software developers who can leverage mature libraries such as OpenCV. However, as they move beyond their first experiments in computer vision, developers may struggle to ensure that their solutions are sufficiently well optimized, well trained, robust, and adaptive in real-world conditions. With sufficient knowledge of OpenCV, these developers will have enough confidence to go about creating projects in the field of computer vision.

This book will help you tackle increasingly challenging computer vision problems that you may face in your careers. It makes use of OpenCV 3 to work around some interesting projects. Inside these pages, you will find practical and innovative approaches that are battle-tested in the authors' industry experience and research. Each chapter covers the theory and practice of multiple complementary approaches so that you will be able to choose wisely in your future projects. You will also gain insights into the architecture and algorithms that underpin OpenCV's functionality.

We begin by taking a critical look at inputs in order to decide which kinds of light, cameras, lenses, and image formats are best suited to a given purpose. We proceed to consider the finer aspects of computational photography as we build an automated camera to assist nature photographers. You will gain a deep understanding of some of the most widely applicable and reliable techniques in object detection, feature selection, tracking, and even biometric recognition. We will also build Android projects in which we explore the complexities of camera motion: first in panoramic image stitching and then in video stabilization.

By the end of the book, you will have a much richer understanding of imaging, motion, machine learning, and the architecture of computer vision libraries and applications!

OpenCV 3 Blueprints

By Joseph Howse, Steven Puttemans, Quan Hua, Utkarsh Sinha

OpenCV 3 Blueprints By Joseph Howse, Steven Puttemans, Quan Hua, Utkarsh Sinha

Expand your knowledge of computer vision by building amazing projects with OpenCV 3

About This Book

- Build computer vision projects to capture high-quality image data, detect and track objects, process the actions of humans or animals, and much more
- Discover practical and interesting innovations in computer vision while building atop a mature open-source library, OpenCV 3
- Familiarize yourself with multiple approaches and theories wherever critical decisions need to be made

Who This Book Is For

This book is ideal for you if you aspire to build computer vision systems that are smarter, faster, more complex, and more practical than the competition. This is an advanced book intended for those who already have some experience in setting up an OpenCV development environment and building applications with OpenCV. You should be comfortable with computer vision concepts, object-oriented programming, graphics programming, IDEs, and the command line.

What You Will Learn

- Select and configure camera systems to see invisible light, fast motion, and distant objects
- Build a “camera trap”, as used by nature photographers, and process photos to create beautiful effects
- Develop a facial expression recognition system with various feature extraction techniques and machine learning methods
- Build a panorama Android application using the OpenCV stitching module in C++ with NDK support
- Optimize your object detection model, make it rotation invariant, and apply scene-specific constraints to make it faster and more robust
- Create a person identification and registration system based on biometric properties of that person, such as their fingerprint, iris, and face
- Fuse data from videos and gyroscopes to stabilize videos shot from your mobile phone and create hyperlapse style videos

In Detail

Computer vision is becoming accessible to a large audience of software developers who can leverage mature libraries such as OpenCV. However, as they move beyond their first experiments in computer vision, developers may struggle to ensure that their solutions are sufficiently well optimized, well trained, robust, and adaptive in real-world conditions. With sufficient knowledge of OpenCV, these developers will have enough confidence to go about creating projects in the field of computer vision.

This book will help you tackle increasingly challenging computer vision problems that you may face in your

careers. It makes use of OpenCV 3 to work around some interesting projects. Inside these pages, you will find practical and innovative approaches that are battle-tested in the authors' industry experience and research. Each chapter covers the theory and practice of multiple complementary approaches so that you will be able to choose wisely in your future projects. You will also gain insights into the architecture and algorithms that underpin OpenCV's functionality.

We begin by taking a critical look at inputs in order to decide which kinds of light, cameras, lenses, and image formats are best suited to a given purpose. We proceed to consider the finer aspects of computational photography as we build an automated camera to assist nature photographers. You will gain a deep understanding of some of the most widely applicable and reliable techniques in object detection, feature selection, tracking, and even biometric recognition. We will also build Android projects in which we explore the complexities of camera motion: first in panoramic image stitching and then in video stabilization.

By the end of the book, you will have a much richer understanding of imaging, motion, machine learning, and the architecture of computer vision libraries and applications!

OpenCV 3 Blueprints By Joseph Howse, Steven Puttemans, Quan Hua, Utkarsh Sinha Bibliography

- Rank: #487652 in eBooks
- Published on: 2015-11-10
- Released on: 2015-11-10
- Format: Kindle eBook

Editorial Review

About the Author
Joseph Howse Joseph Howse lives in Canada. During the cold winters, he grows a beard and his four cats grow thick coats of fur. He combs the cats every day. Sometimes, the cats pull his beard. Joseph has been writing for Packt Publishing since 2012. His books include OpenCV for Secret Agents, OpenCV 3 Blueprints, Android Application Programming with OpenCV 3, Learning OpenCV 3 Computer Vision with Python, and Python Game Programming by Example. When he is not writing books or grooming cats, Joseph provides consulting, training, and software development services through his company, Nummist Media (http://nummist.com).

Steven Puttemans Steven Puttemans is a PhD research candidate at the KU Leuven, Department of Industrial Engineering Sciences. At this university, he is working for the EAVISE research group, which focuses on combining computer vision and artificial intelligence. He obtained a master of science degree in Electronics-ICT and further expanded his interest in computer vision by obtaining a master of science in artificial intelligence. As an enthusiastic researcher, his goal is to combine state-of-the-art computer vision algorithms with real-life industrial problems to provide robust and complete object detection solutions for the industry. His previous projects include TOBCAT, an open source object detection framework for industrial object detection problems, and a variety of smaller computer vision-based industrial projects. During these projects, Steven worked closely with the industry. Steven is also an active participant in the OpenCV community. He is a moderator of the OpenCV Q&A forum, and has submitted or reviewed many bug fixes and improvements for OpenCV 3. He also focuses on putting as much of his research as possible back into the framework to further support the open source spirit. More info about Steven's research, projects, and interests can be found at https://stevenputtemans.github.io.

Quan Hua Quan Hua is a software engineer at Autonomous, a start-up company in robotics, where he focuses on developing computer vision and machine learning applications for personal robots. He earned a bachelor of science degree from the University of Science, Vietnam, specializing in computer vision, and published a research paper in CISIM 2014. As the owner of Quan404.com, he also blogs about various computer vision techniques to share his experience with the community.

Utkarsh Sinha Utkarsh Sinha lives in Pittsburgh, Pennsylvania, where he is pursuing a master's in computer vision at Carnegie Mellon University. He intends to learn the state of the art of computer vision at the university and work on real-life industrial scale computer vision challenges. Before joining CMU, he worked as a Technical Director at Dream works Animation on movies such as Home, How to Train your Dragon 2, and Madagascar 3. His work spans multiple movies and multiple generations of graphics technology. He earned his bachelor of engineering degree in computer science and his master of science degree in mathematics from BITS-Pilani, Goa. He has been working in the field of computer vision for about 6 years as a consultant and as a software engineer at start-ups. He blogs at http://utkarshsinha.com/ about various topics in technology?most of which revolve around computer vision. He also publishes computer vision tutorials on the Internet through his website, AI Shack (http://aishack.in/).His articles help people understand concepts in computer vision every day.

Users Review

From reader reviews:

Nancy Martindale:

Do you have favorite book? If you have, what is your favorite's book? E-book is very important thing for us to be aware of everything in the world. Each guide has different aim or perhaps goal; it means that e-book has different type. Some people experience enjoy to spend their the perfect time to read a book. They are really reading whatever they acquire because their hobby is reading a book. What about the person who don't like looking at a book? Sometime, individual feel need book if they found difficult problem or maybe exercise. Well, probably you will need this OpenCV 3 Blueprints.

Tony Hill:

Have you spare time for the day? What do you do when you have much more or little spare time? Yeah, you can choose the suitable activity to get spend your time. Any person spent all their spare time to take a walk, shopping, or went to the particular Mall. How about open or perhaps read a book allowed OpenCV 3 Blueprints? Maybe it is to be best activity for you. You recognize beside you can spend your time with your favorite's book, you can better than before. Do you agree with their opinion or you have various other opinion?

Charles Wright:

Reading a guide tends to be new life style in this particular era globalization. With reading through you can get a lot of information that may give you benefit in your life. Together with book everyone in this world can easily share their idea. Publications can also inspire a lot of people. Lots of author can inspire their reader with their story or maybe their experience. Not only the storyline that share in the guides. But also they write about advantage about something that you need example of this. How to get the good score toefl, or how to teach your sons or daughters, there are many kinds of book that exist now. The authors in this world always try to improve their ability in writing, they also doing some analysis before they write with their book. One of them is this OpenCV 3 Blueprints.

Beatrice Rogers:

A lot of people always spent all their free time to vacation or maybe go to the outside with them friends and family or their friend. Do you know? Many a lot of people spent that they free time just watching TV, or playing video games all day long. If you wish to try to find a new activity that is look different you can read the book. It is really fun for yourself. If you enjoy the book which you read you can spent 24 hours a day to reading a guide. The book OpenCV 3 Blueprints it doesn't matter what good to read. There are a lot of those who recommended this book. We were holding enjoying reading this book. If you did not have enough space to bring this book you can buy the particular e-book. You can m0ore easily to read this book from your smart phone. The price is not to cover but this book possesses high quality.

Read OpenCV 3 Blueprints By Joseph Howse, Steven Puttemans, Quan Hua, Utkarsh Sinha for online ebook

OpenCV 3 Blueprints By Joseph Howse, Steven Puttemans, Quan Hua, Utkarsh Sinha Free PDF d0wnl0ad, audio books, books to read, good books to read, cheap books, good books, online books, books online, book reviews epub, read books online, books to read online, online library, greatbooks to read, PDF best books to read, top books to read OpenCV 3 Blueprints By Joseph Howse, Steven Puttemans, Quan Hua, Utkarsh Sinha books to read online.

Online OpenCV 3 Blueprints By Joseph Howse, Steven Puttemans, Quan Hua, Utkarsh Sinha ebook PDF download

OpenCV 3 Blueprints By Joseph Howse, Steven Puttemans, Quan Hua, Utkarsh Sinha Doc

OpenCV 3 Blueprints By Joseph Howse, Steven Puttemans, Quan Hua, Utkarsh Sinha Mobipocket

OpenCV 3 Blueprints By Joseph Howse, Steven Puttemans, Quan Hua, Utkarsh Sinha EPub

83JNLESPMYQ: OpenCV 3 Blueprints By Joseph Howse, Steven Puttemans, Quan Hua, Utkarsh Sinha