

Mastering Opencv With Practical Computer Vision Projects

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Mastering OpenCV 4 with Python
Mastering OpenCV with Practical Computer Vision Projects
Practical OpenCV
OpenCV 3.0 Computer Vision with Java
A Practical Introduction to Computer Vision with OpenCV
Mastering OpenCV with Python: Use NumPy, Scikit, TensorFlow, and Matplotlib to learn Advanced algorithms for Machine Learning through a set of Practical Projects
Mastering OpenCV with Python
Machine Vision and Mechatronics in Practice
A Practical Introduction to Computer Vision with OpenCV, Enhanced Edition
Advanced Machine Learning Technologies and Applications
Learn Autonomous Programming with Python
Hands-on ML Projects with OpenCV
Thoughtful Machine Learning Algorithms for Image Processing and Computer Vision
Opencv by Example
Robotics in Theory and Practice
Instant OpenCV Starter
Hands-on ML Projects with OpenCV: Master Computer Vision and Machine Learning using OpenCV and Python
Practical Computer Vision
Daniel Lélis Baggio Alberto Fernández Villán Daniel Lélis Baggio Samarth Brahmbhatt Daniel Lélis Baggio Kenneth Dawson-Howe Ayush Vaishya Ayush Vaishya John Billingsley Kenneth Dawson-Howe Aboul Ella Hassanien Varun P Divadkar Mugesh S. Matthew Kirk J. R. Parker Prateek Joshi Lucia Pachnikova Jayneil Dalal Mugesh S. Abhinav Dadhich
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each chapter in the book is an individual project and each project is constructed with step

by step instructions clearly explained code and includes the necessary screenshots you should have basic opencv and c c programming experience before reading this book as it is aimed at computer science graduates researchers and computer vision experts widening their expertise

create advanced applications with python and opencv exploring the potential of facial recognition machine learning deep learning web computing and augmented reality key featuresdevelop your computer vision skills by mastering algorithms in open source computer vision 4 opencv 4 and pythonapply machine learning and deep learning techniques with tensorflow and kerasdiscover the modern design patterns you should avoid when developing efficient computer vision applicationsbook description opencv is considered to be one of the best open source computer vision and machine learning software libraries it helps developers build complete projects in relation to image processing motion detection or image segmentation among many others opencv for python enables you to run computer vision algorithms smoothly in real time combining the best of the opencv c api and the python language in this book you ll get started by setting up opencv and delving into the key concepts of computer vision you ll then proceed to study more advanced concepts and discover the full potential of opencv the book will also introduce you to the creation of advanced applications using python and opencv enabling you to develop applications that include facial recognition target tracking or augmented reality next you ll learn machine learning techniques and concepts understand how to apply them in real world examples and also explore their benefits including real time data production and faster data processing you ll also discover how to translate the functionality provided by opencv into optimized application code projects using python bindings toward the concluding chapters you ll explore the application of artificial intelligence and deep learning techniques using the popular python libraries tensorflow and keras by the end of this book you ll be able to develop advanced computer vision applications to meet your customers demands what you will learnhandle files and images and explore various image processing techniquesexplore image transformations including translation resizing and croppinggain insights into building histogramsbrush up on contour detection filtering and drawingwork with augmented reality to build marker based and markerless applicationswork with the main machine learning algorithms in opencvexplore the deep learning python libraries and opencv deep learning capabilitiescreate computer vision and deep learning web applicationswho this book is for this book is designed for computer vision developers engineers and researchers who want to develop modern computer vision applications basic experience of opencv and python programming is a must

this is the definitive advanced tutorial for opencv designed for those with basic c skills the computer vision projects are divided into easily assimilated chapters with an emphasis on practical involvement for an easier learning curve cool fun and advanced projects that cover the various aspects of opencv programming strong emphasis on programming techniques and methodology for the best approach to each project ten projects that are carefully

designed to build on your skills at every step in detail opencv is a computer vision library that is extensively used in companies research groups and governmental bodies for real time capture video file import image manipulation object detection and much more its comprehensive set of computer vision and machine learning algorithms makes it the obvious choice for professionals to develop visual applications with this book in hand you would not need to plow through several pages of theory as this book will take you through the creation of many exciting projects that showcase the huge range of possibilities that open up when opencv is exploited to its full potential

practical opencv is a hands on project book that shows you how to get the best results from opencv the open source computer vision library computer vision is key to technologies like object recognition shape detection and depth estimation opencv is an open source library with over 2500 algorithms that you can use to do all of these as well as track moving objects extract 3d models and overlay augmented reality it s used by major companies like google in its autonomous car intel and sony and it is the backbone of the robot operating system s computer vision capability in short if you re working with computer vision at all you need to know opencv with practical opencv you ll be able to get opencv up and running on windows or linux use opencv to control the camera board and run vision algorithms on raspberry pi understand what goes on behind the scenes in computer vision applications like object detection image stitching filtering stereo vision and more code complex computer vision projects for your class hobby robot job many of which can execute in real time on off the shelf processors combine different modules that you develop to create your own interactive computer vision app what you ll learn the ins and outs of opencv programming on windows and linux transforming and filtering images detecting corners edges lines and circles in images and video detecting pre trained objects in images and video making panoramas by stitching images together getting depth information by using stereo cameras basic machine learning techniques bonus learn how to run opencv on raspberry pi who this book is for this book is for programmers and makers with little or no previous exposure to computer vision some proficiency with c is required table of contentspart 1 getting comfortable chapter 1 introduction to computer vision and opencv chapter 2 setting up opencv on your computer chapter 3 cv bling opencv inbuilt demos chapter 4 basic operations on images and gui windows part 2 advanced computer vision problems and coding them in opencv chapter 5 image filtering chapter 6 shapes in images chapter 7 image segmentation and histograms chapter 8 basic machine learning and keypoint based object detection chapter 9 affine and perspective transformations and their applications to image panoramas chapter 10 3d geometry and stereo vision chapter 11 embedded computer vision running opencv programs on the raspberry pi

opencv 3 0 computer vision with java is a practical tutorial guide that explains fundamental tasks from computer vision while focusing on java development this book will teach you how to set up opencv for java and handle matrices using the basic operations of image processing such as filtering and image transforms it will also help you learn how to use haar

cascades for tracking faces and to detect foreground and background regions with the help of a kinect device it will even give you insights into server side opencv each chapter is presented with several projects that are ready to use the functionality of these projects is found in many classes that allow developers to understand computer vision principles and rapidly extend or customize the projects for their needs

explains the theory behind basic computer vision and provides a bridge from the theory to practical implementation using the industry standard opencv libraries computer vision is a rapidly expanding area and it is becoming progressively easier for developers to make use of this field due to the ready availability of high quality libraries such as opencv 2 this text is intended to facilitate the practical use of computer vision with the goal being to bridge the gap between the theory and the practical implementation of computer vision the book will explain how to use the relevant opencv library routines and will be accompanied by a full working program including the code snippets from the text this textbook is a heavily illustrated practical introduction to an exciting field the applications of which are becoming almost ubiquitous we are now surrounded by cameras for example cameras on computers tablets cameras built into our mobile phones cameras in games consoles cameras imaging difficult modalities such as ultrasound x ray mri in hospitals and surveillance cameras this book is concerned with helping the next generation of computer developers to make use of all these images in order to develop systems which are more intuitive and interact with us in more intelligent ways explains the theory behind basic computer vision and provides a bridge from the theory to practical implementation using the industry standard opencv libraries offers an introduction to computer vision with enough theory to make clear how the various algorithms work but with an emphasis on practical programming issues provides enough material for a one semester course in computer vision at senior undergraduate and masters levels includes the basics of cameras and images and image processing to remove noise before moving on to topics such as image histogramming binary imaging video processing to detect and model moving objects geometric operations camera models edge detection features detection recognition in images contains a large number of vision application problems to provide students with the opportunity to solve real problems images or videos for these problems are provided in the resources associated with this book which include an enhanced ebook

unlocking visual insights opencv made simple and powerful key features opencv mastery harness the full potential of opencv comprehensive coverage from fundamentals to advanced techniques practical exercises apply knowledge through hands on tasks book description mastering opencv with python immerses you in the captivating realm of computer vision with a structured approach that equips you with the knowledge and skills essential for success in this rapidly evolving field from grasping the fundamental concepts of image processing and opencv to mastering advanced techniques such as neural networks and object detection you will gain a comprehensive understanding each chapter is enriched with hands on exercises and real world projects ensuring the acquisition of practical skills

that can be immediately applied in your professional journey this book not only elevates your technical proficiency but also prepares you for a rewarding career the technological job landscape is constantly evolving and professionals who can harness the potential of computer vision are in high demand by mastering the skills and insights contained within these pages you will be well prepared to explore exciting career opportunities ranging from machine learning engineering to computer vision research this book is your ticket to a future filled with innovation and professional advancement within the dynamic world of computer vision what you will learn master image processing and machine learning with opencv using advanced tools and libraries create real world projects with hands on experience explore machine learning for computer vision develop confidence in practical computer vision projects conquer real world image processing challenges apply computer vision across diverse industries boost your career in computer vision become an expert in computer vision for career advancement who is this book for this beginner friendly book in computer vision requires no prior experience making it accessible to newcomers while a basic programming understanding is helpful it s designed to guide individuals from diverse backgrounds into the captivating realms of ai computer vision and image processing it s equally valuable for aspiring tech professionals students and enthusiasts seeking rewarding careers and knowledge in these cutting edge fields table of contents 1 introduction to computer vision 2 getting started with images 3 image processing fundamentals 4 image operations 5 image histograms 6 image segmentation 7 edges and contours 8 machine learning with images 9 advanced computer vision algorithms 10 neural networks 11 object detection using opencv 12 projects using opencv index

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projects conquer real world image processing challenges apply computer vision across diverse industries boost your career in computer vision become an expert in computer vision for career advancement who is this book for this beginner friendly book in computer vision requires no prior experience making it accessible to newcomers while a basic programming understanding is helpful it s designed to guide individuals from diverse backgrounds into the captivating realms of ai computer vision and image processing it s equally valuable for aspiring tech professionals students and enthusiasts seeking rewarding careers and knowledge in these cutting edge fields table of contents 1 introduction to computer vision 2 getting started with images 3 image processing fundamentals 4 image operations 5 image histograms 6 image segmentation 7 edges and contours 8 machine learning with images 9 advanced computer vision algorithms 10 neural networks 11 object detection using opencv 12 projects using opencv index

the contributions for this book have been gathered over several years from conferences held in the series of mechatronics and machine vision in practice the latest of which was held in ankara turkey the essential aspect is that they concern practical applications rather than the derivation of mere theory though simulations and visualization are important components the topics range from mining with its heavy engineering to the delicate machining of holes in the human skull or robots for surgery on human flesh mobile robots continue to be a hot topic both from the need for navigation and for the task of stabilization of unmanned aerial vehicles the swinging of a spray rig is damped while machine vision is used for the control of heating in an asphalt laying machine manipulators are featured both for general tasks and in the form of grasping fingers a robot arm is proposed for adding to the mobility scooter of the elderly can eeg signals be a means to control a robot can face recognition be achieved in varying illumination

explains the theory behind basic computer vision and provides a bridge from the theory to practical implementation using the industry standard opencv libraries computer vision is a rapidly expanding area and it is becoming progressively easier for developers to make use of this field due to the ready availability of high quality libraries such as opencv 2 this text is intended to facilitate the practical use of computer vision with the goal being to bridge the gap between the theory and the practical implementation of computer vision the book will explain how to use the relevant opencv library routines and will be accompanied by a full working program including the code snippets from the text this textbook is a heavily illustrated practical introduction to an exciting field the applications of which are becoming almost ubiquitous we are now surrounded by cameras for example cameras on computers tablets cameras built into our mobile phones cameras in games consoles cameras imaging difficult modalities such as ultrasound x ray mri in hospitals and surveillance cameras this book is concerned with helping the next generation of computer developers to make use of all these images in order to develop systems which are more intuitive and interact with us in more intelligent ways explains the theory behind basic computer vision and provides a bridge from the theory to practical implementation using the industry standard opencv

libraries offers an introduction to computer vision with enough theory to make clear how the various algorithms work but with an emphasis on practical programming issues provides enough material for a one semester course in computer vision at senior undergraduate and masters levels includes the basics of cameras and images and image processing to remove noise before moving on to topics such as image histogramming binary imaging video processing to detect and model moving objects geometric operations camera models edge detection features detection recognition in images contains a large number of vision application problems to provide students with the opportunity to solve real problems images or videos for these problems are provided in the resources associated with this book which include an enhanced ebook

this book presents the refereed proceedings of the 5th international conference on advanced machine learning technologies and applications amlta 2020 held at manipal university jaipur india on february 13 15 2020 and organized in collaboration with the scientific research group in egypt srge the papers cover current research in machine learning big data internet of things biomedical engineering fuzzy logic and security as well as intelligence swarms and optimization

unleash the hidden potential of python to emerge as a change maker of contemporary industry key features explore python commands for rpa workflows and hyperautomation concise chapters with lucid examples and elaborate codes that make learning interesting practical industry use case at the end of every chapter to highlight its real world application description the current industry also called industry 4 0 has witnessed an unprecedented expansion of technology in a short span of time owing to an exponential increase in computational power coupled with internet technology consequently domains like artificial intelligence machine learning deep learning and robotic process automation have gained prominence and become the backbone of organizations making it inevitable for professionals to upgrade their skills in these domains orchestrate your work with ai and ml learn rpa s power conduct web symphonies utilize spreadsheets and automate emails you can also extract data from pdfs and images choreograph applications and play with deep learning design workflows create hyperautomation finales and combine python with uipath you can further build a solid stage for your projects with pyscript and continue with test automation this book equips you to revolutionize your work one python script at a time this book can be used as ready to reference as well as a user manual for quick solutions to common organizational needs and even for brushing up on key technical domain concepts what you will learn you will have a clear understanding of python and create concise flexible and maintainable applications for current industry needs you will explore web scraping techniques using powerful libraries to extract valuable data from the web you will have a high level overview of fundamentals in ml deep learning rpa and hyperautomation you will learn to write compact and maintainable code in python catering to typical applications in contemporary industries you will also learn how to apply your learnings to real world industry scenarios using the practical python use cases presented at the end of each chapter who

this book is for this book is specifically meant for students and professionals who have prior working knowledge of python from a basic to intermediate level and would want to expand their horizon of python programming table of contents 1 why python for automation 2 rpa foundations 3 getting started with ai ml in python 4 automating scraping 5 automating excel and spreadsheets 6 automating emails and messaging 7 working with pdfs and images 8 mechanizing applications folders and actions 9 intelligent automation part 1 using machine learning 10 intelligent automation part 2 using deep learning 11 automating business process workflows 12 hyperautomation 13 python and uipath 14 architecting automation projects 15 the pyscript framework 16 test automation in python

be at your a game in building intelligent systems by leveraging computer vision and machine learning key features step by step instructions and code snippets for real world ml projects covers entire spectrum from basics to advanced concepts such as deep learning transfer learning and model optimization loaded with practical tips and best practices for implementing machine learning with opencv for optimising your workflow description this book is an in depth guide that merges machine learning techniques with opencv the most popular computer vision library using python the book introduces fundamental concepts in machine learning and computer vision progressing to practical implementation with opencv concepts related to image preprocessing contour and thresholding techniques motion detection and tracking are explained in a step by step manner using code and output snippets hands on projects with real world datasets will offer you an invaluable experience in solving opencv challenges with machine learning it s an ultimate guide to explore areas like deep learning transfer learning and model optimization empowering readers to tackle complex tasks every chapter offers practical tips and tricks to build effective ml models by the end you would have mastered and applied ml concepts confidently to real world computer vision problems and will be able to develop robust and accurate machine learning models for diverse applications whether you are new to machine learning or seeking to enhance your computer vision skills this book is an invaluable resource for mastering the integration of machine learning and computer vision using opencv and python what will you learn learn how to work with images and perform basic image processing tasks using opencv implement machine learning techniques to computer vision tasks such as image classification object detection and image segmentation work on real world projects and datasets to gain hands on experience in applying machine learning techniques with opencv explore the concepts of deep learning using tensorflow and keras and how it can be used for computer vision tasks understand the concept of transfer learning and how pre trained models can be leveraged for new tasks utilize techniques for model optimization and deployment in resource constrained environments implement end to end solutions and address challenges encountered in practical scenarios who is this book for this book is for everyone with a basic understanding of programming and who wants to apply machine learning in computer vision using opencv and python whether you re a student researcher or developer this book will equip you with practical skills for machine learning projects some familiarity with python and machine learning concepts is assumed beginners too will find this

book valuable as it offers clear examples and explanations for every concept table of contents chapter 1 getting started with opencv chapter 2 basic image video analytics in opencv chapter 3 image processing 1 using opencv chapter 4 image processing 2 using opencv chapter 5 thresholding and contour techniques using opencv chapter 6 detect corners and road lane using opencv chapter 7 object and motion detection using opencv chapter 8 image segmentation and detecting faces using opencv chapter 9 introduction to deep learning with opencv chapter 10 advance deep learning projects with opencv chapter 11 deployment of opencv projects

learn how to apply test driven development tdd to machine learning algorithms and catch mistakes that could sink your analysis in this practical guide author matthew kirk takes you through the principles of tdd and machine learning and shows you how to apply tdd to several machine learning algorithms including naive bayesian classifiers and neural networks machine learning algorithms often have tests baked in but they can't account for human errors in coding rather than blindly rely on machine learning results as many researchers have you can mitigate the risk of errors with tdd and write clean stable machine learning code if you're familiar with ruby 2.1 you're ready to start apply tdd to write and run tests before you start coding learn the best uses and tradeoffs of eight machine learning algorithms use real world examples to test each algorithm through engaging hands on exercises understand the similarities between tdd and the scientific method for validating solutions be aware of the risks of machine learning such as underfitting and overfitting data explore techniques for improving your machine learning models or data extraction

a cookbook of algorithms for common image processing applications thanks to advances in computer hardware and software algorithms have been developed that support sophisticated image processing without requiring an extensive background in mathematics this bestselling book has been fully updated with the newest of these including 2d vision methods in content based searches and the use of graphics cards as image processing computational aids it's an ideal reference for software engineers and developers advanced programmers graphics programmers scientists and other specialists who require highly specialized image processing algorithms now exist for a wide variety of sophisticated image processing applications required by software engineers and developers advanced programmers graphics programmers scientists and related specialists this bestselling book has been completely updated to include the latest algorithms including 2d vision methods in content based searches details on modern classifier methods and graphics cards used as image processing computational aids saves hours of mathematical calculating by using distributed processing and gpu programming and gives non mathematicians the shortcuts needed to program relatively sophisticated applications algorithms for image processing and computer vision 2nd edition provides the tools to speed development of image processing applications

enhance your understanding of computer vision and image processing by developing real

world projects in opencv 3 about this book get to grips with the basics of computer vision and image processing this is a step by step guide to developing several real world computer vision projects using opencv 3 this book takes a special focus on working with tesseract ocr a free open source library to recognize text in images who this book is for if you are a software developer with a basic understanding of computer vision and image processing and want to develop interesting computer vision applications with open cv this is the book for you knowledge of c is required what you will learn install opencv 3 on your operating system create the required cmake scripts to compile the c application and manage its dependencies get to grips with the computer vision workflows and understand the basic image matrix format and filters understand the segmentation and feature extraction techniques remove backgrounds from a static scene to identify moving objects for video surveillance track different objects in a live video using various techniques use the new opencv functions for text detection and recognition with tesseract in detail open cv is a cross platform free for use library that is primarily used for real time computer vision and image processing it is considered to be one of the best open source libraries that helps developers focus on constructing complete projects on image processing motion detection and image segmentation whether you are completely new to the concept of computer vision or have a basic understanding of it this book will be your guide to understanding the basic opencv concepts and algorithms through amazing real world examples and projects starting from the installation of opencv on your system and understanding the basics of image processing we swiftly move on to creating optical flow video analysis or text recognition in complex scenes and will take you through the commonly used computer vision techniques to build your own open cv projects from scratch by the end of this book you will be familiar with the basics of open cv such as matrix operations filters and histograms as well as more advanced concepts such as segmentation machine learning complex video analysis and text recognition style and approach this book is a practical guide with lots of tips and is closely focused on developing computer vision applications with opencv beginning with the fundamentals the complexity increases with each chapter sample applications are developed throughout the book that you can execute and use in your own projects

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get to grips with a new technology understand what it is and what it can do for you and then get to work with the most important features and tasks a practical quick and hands on guide for python developers and hobbyists who want to get started with computer vision with opencv this book is great for developers hobbyists and students new to computer vision who are looking to get a good grounding in how to use the opencv library it is assumed that you will have some basic experience in c/c++ programming

be at your a game in building intelligent systems by leveraging computer vision and machine learning key features step by step instructions and code snippets for real world ml projects

covers entire spectrum from basics to advanced concepts such as deep learning transfer learning and model optimization loaded with practical tips and best practices for implementing machine learning with opencv for optimising your workflow book description this book is an in depth guide that merges machine learning techniques with opencv the most popular computer vision library using python the book introduces fundamental concepts in machine learning and computer vision progressing to practical implementation with opencv concepts related to image preprocessing contour and thresholding techniques motion detection and tracking are explained in a step by step manner using code and output snippets hands on projects with real world datasets will offer you an invaluable experience in solving opencv challenges with machine learning it s an ultimate guide to explore areas like deep learning transfer learning and model optimization empowering readers to tackle complex tasks every chapter offers practical tips and tricks to build effective ml models by the end you would have mastered and applied ml concepts confidently to real world computer vision problems and will be able to develop robust and accurate machine learning models for diverse applications whether you are new to machine learning or seeking to enhance your computer vision skills this book is an invaluable resource for mastering the integration of machine learning and computer vision using opencv and python what you will learn learn how to work with images and perform basic image processing tasks using opencv implement machine learning techniques to computer vision tasks such as image classification object detection and image segmentation work on real world projects and datasets to gain hands on experience in applying machine learning techniques with opencv explore the concepts of deep learning using tensorflow and keras and how it can be used for computer vision tasks who is this book for this book is for everyone with a basic understanding of programming and who wants to apply machine learning in computer vision using opencv and python whether you re a student researcher or developer this book will equip you with practical skills for machine learning projects some familiarity with python and machine learning concepts is assumed table of contentschapter 1 getting started with opencv chapter 2 basic image video analytics in opencv chapter 3 image processing 1 using opencv chapter 4 image processing 2 using opencv chapter 5 thresholding and contour techniques using opencv chapter 6 detect corners and road lane using opencv chapter 7 object and motion detection using opencv chapter 8 image segmentation and detecting faces using opencv chapter 9 introduction to deep learning with opencv chapter 10 advance deep learning projects with opencv chapter 11 deployment of opencv projects

a practical guide designed to get you from basics to current state of art in computer vision systems key features master the different tasks associated with computer vision and develop your own computer vision applications with ease leverage the power of python tensorflow keras and opencv to perform image processing object detection feature detection and more with real world datasets and fully functional code this book is your one stop guide to understanding computer vision book description in this book you will find several recently proposed methods in various domains of computer vision you will start by setting up the proper python environment to work on practical applications this includes setting up libraries

such as opencv tensorflow and keras using anaconda using these libraries you ll start to understand the concepts of image transformation and filtering you will find a detailed explanation of feature detectors such as fast and orb you ll use them to find similar looking objects with an introduction to convolutional neural nets you will learn how to build a deep neural net using keras and how to use it to classify the fashion mnist dataset with regard to object detection you will learn the implementation of a simple face detector as well as the workings of complex deep learning based object detectors such as faster r cnn and ssd using tensorflow you ll get started with semantic segmentation using fcn models and track objects with deep sort not only this you will also use visual slam techniques such as orb slam on a standard dataset by the end of this book you will have a firm understanding of the different computer vision techniques and how to apply them in your applications what you will learn learn the basics of image manipulation with opencv implement and visualize image filters such as smoothing dilation histogram equalization and more set up various libraries and platforms such as opencv keras and tensorflow in order to start using computer vision along with appropriate datasets for each chapter such as mscoco mot and fashion mnist understand image transformation and downsampling with practical implementations explore neural networks for computer vision and convolutional neural networks using keras understand working on deep learning based object detection such as faster r cnn ssd and more explore deep learning based object tracking in action understand visual slam techniques such as orb slam who this book is for this book is for machine learning practitioners and deep learning enthusiasts who want to understand and implement various tasks associated with computer vision and image processing in the most practical manner possible some programming experience would be beneficial while knowing python would be an added bonus

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