

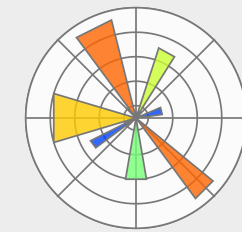
Welcome to the

# BoBiAC

Boston Bioimage Analysis Course | 2025

 **Date:** 14th -19th July 2025, 9:00 am - 6:30 pm

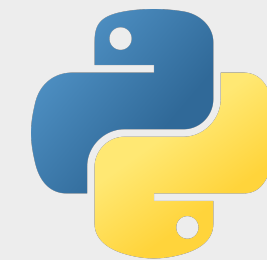
 **Time:** 9:00 am - 6:30 pm



 **location:** Gordon Hall - Harvard Medical School

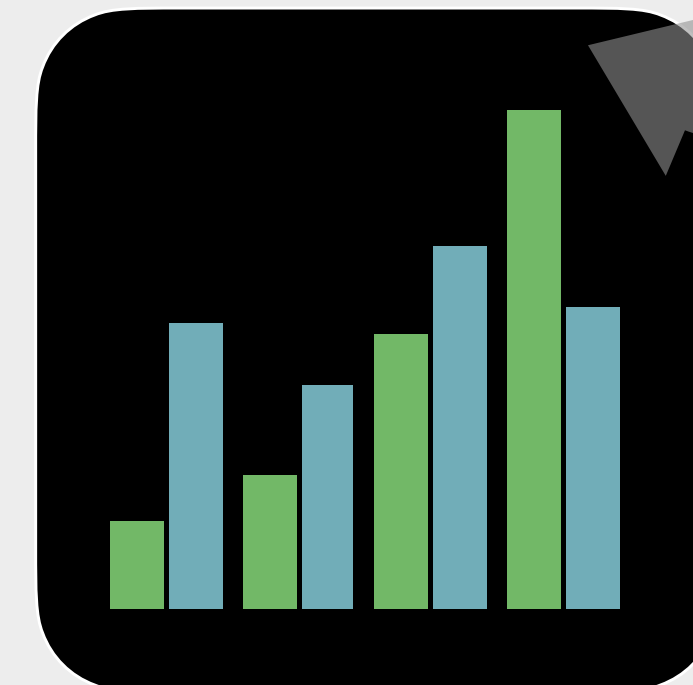
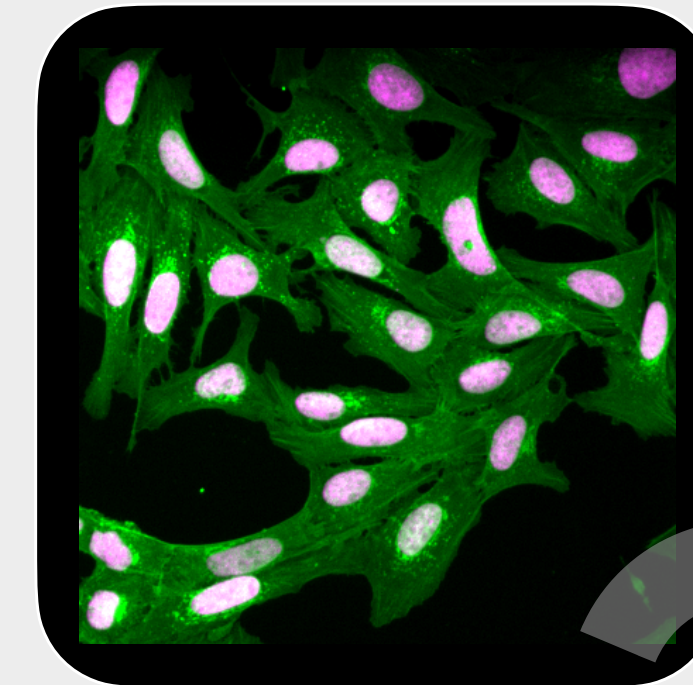
 **website:** [iac.hms.harvard.edu/bobiac/2025](https://iac.hms.harvard.edu/bobiac/2025)

 **course material:** [hms-iac.github.io/bobiac](https://hms-iac.github.io/bobiac)



 **IAC:** [iac.hms.harvard.edu](https://iac.hms.harvard.edu)

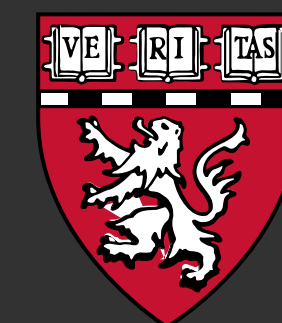
 **CITE:** [cite.hms.harvard.edu](https://cite.hms.harvard.edu)



**CITE**  
Core for Imaging Technology & Education



**BioImaging  
North America**



**HARVARD**  
MEDICAL SCHOOL







# WiFi Connection

---



- ▶ **Harvard Secure:** if you have Harvard credentials
- ▶ **Eduroam:** if you have academic credential (edu)
- ▶ **Harvard Guest:** you will need to register your laptop for that (if you provided the MAC address in advance, you should be able to directly connect)
- ▶ If all of above do not work, let us know!



# Course Structure

---

 [iac.hms.harvard.edu/bobiac/2025](https://iac.hms.harvard.edu/bobiac/2025)



- ▶ The course is designed for **beginners** in python and image analysis
- ▶ Each day consists of a **mix of lectures** explaining key bioimage analysis concepts, interspersed with **practical, hands-on exercises** using **Python**.
- ▶ Every morning, we will **start** the day **with coffee** and **open discussion** (Q&A).
- ▶ Most of these **exercises** will be completed either **step-by-step as a class**.
- ▶ The course should be **interactive**, there are absolutely **no stupid questions**, you are encouraged to ask questions. During the practical exercise feel free to consult with your neighbors, you can help each other to understand concept.
- ▶ Each day, for the first four days of the course, five of you will give a **brief (3–5 minute) introduction about yourself**, your **work**, and the **image analysis tasks** you hope to perform—using the single slide you



# Schedule



[iac.hms.harvard.edu/bobiac/2025](https://iac.hms.harvard.edu/bobiac/2025)



|                  | Monday 14th July | Tuesday 15th July              | Wednesday 16th July    | Thursday 17th July           | Friday 18th July    | Saturday 19th July  |
|------------------|------------------|--------------------------------|------------------------|------------------------------|---------------------|---------------------|
| 9:00am - 9:30am  | Welcome          | Coffee & Questions?            | Coffee & Questions?    | Coffee & Questions?          | Coffee & Questions? | Coffee & Questions? |
| 9:30am - 10:00am | Intro + Coffee   | Introduction to Digital Images | Segmentation (Classic) | Segmentation (Deep Learning) | Student Group Work  | Colocalization      |



# Course Topics I

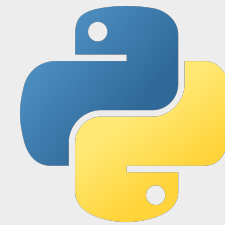
---



[iac.hms.harvard.edu/bobiac/2025](https://iac.hms.harvard.edu/bobiac/2025)



## Learning Python Basics



- ▶ **Getting Started with Python and uv:** what is python? How do I install it? How do I use it?
- ▶ **The Python Basics:** how do I write python code? What is the syntax?





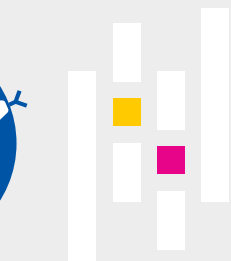
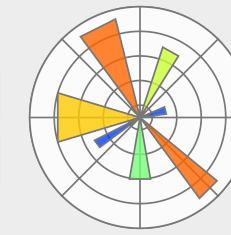
# Course Topics II



[iac.hms.harvard.edu/bobiac/2025](https://iac.hms.harvard.edu/bobiac/2025)



## Learning Python for Bioimage Processing & Analysis



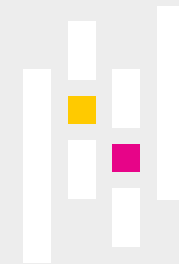
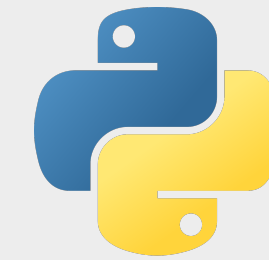


# Learning Objectives

 [iac.hms.harvard.edu/bobiac/2025](https://iac.hms.harvard.edu/bobiac/2025)



► ~~Become a Python & Bioimage Analysis Expert!~~



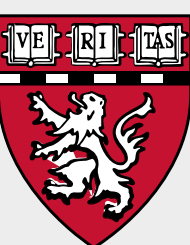


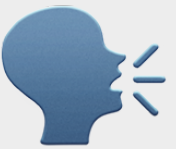


# ? Questions



[iac.hms.harvard.edu/bobiac/2025](https://iac.hms.harvard.edu/bobiac/2025)





# Brief Self-Introduction

---



1. My **name** is Federico
2. My **position** is as a Research Associate
3. My **lab** is the IAC@HMS
4. My model **system** is human iPSC-derived neurons
5. I **acquired** my **data** with a widefield microscope







# Why should you analyze images with computers?

---

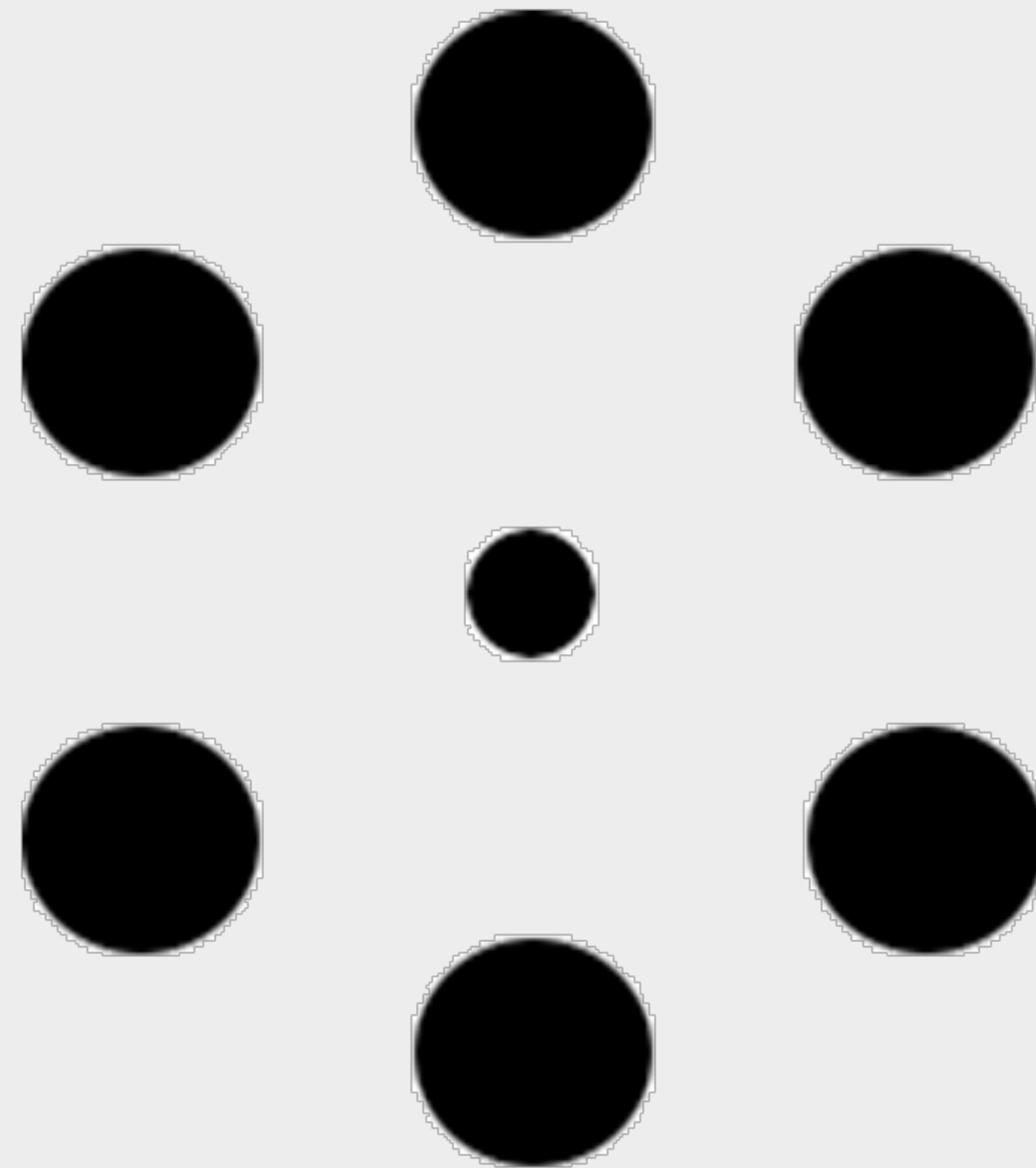




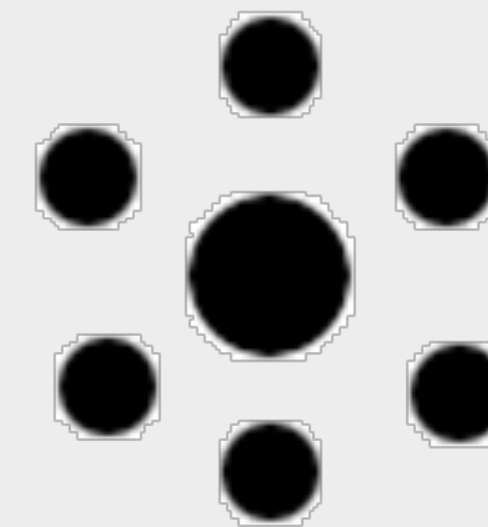


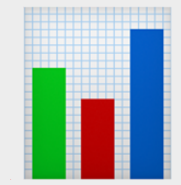


# Why should you analyze images with computers?



identical central discs?

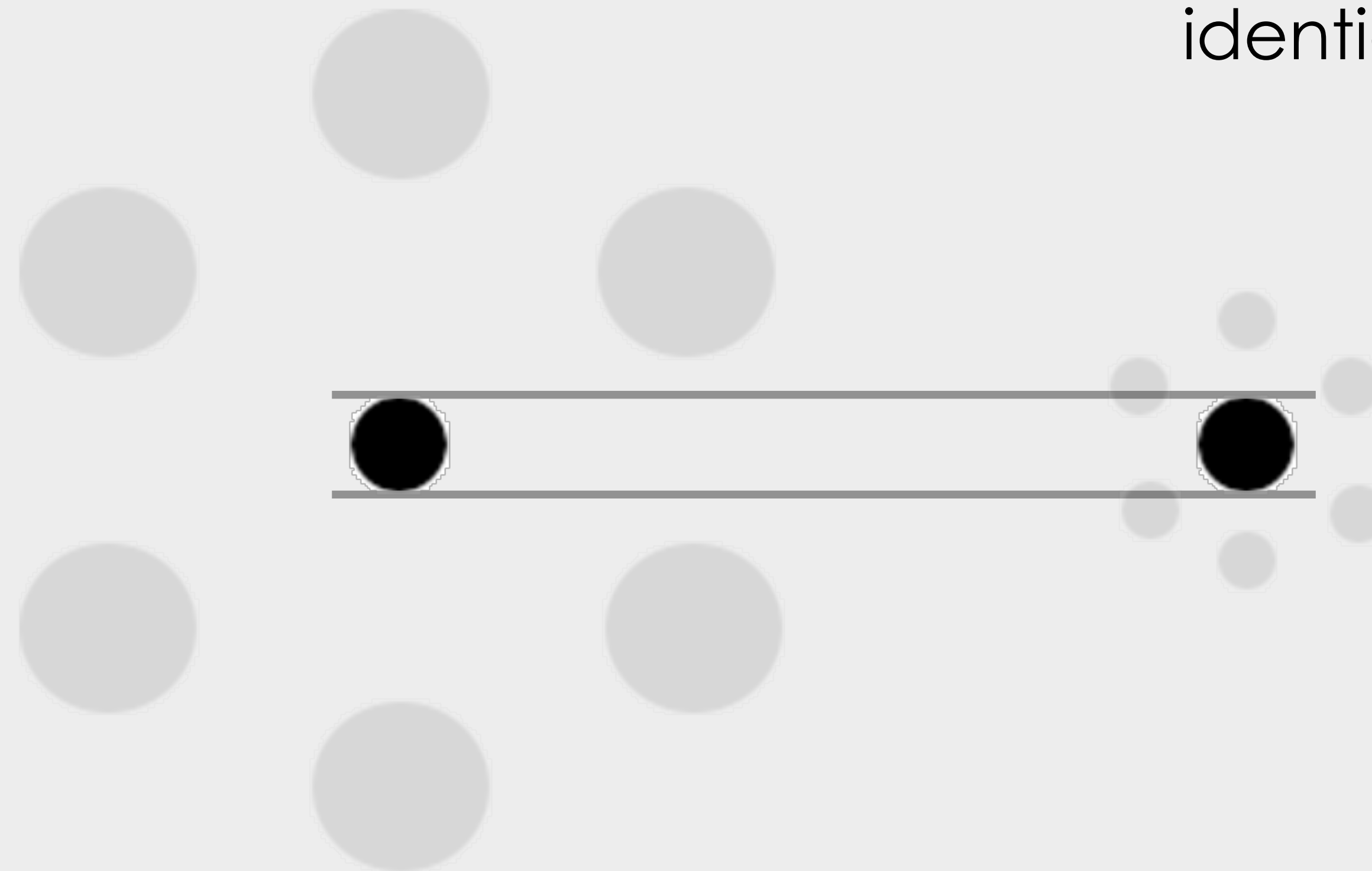




# Why should you analyze images with computers?



identical central discs?



our size estimate is strongly influenced by the local neighborhood.



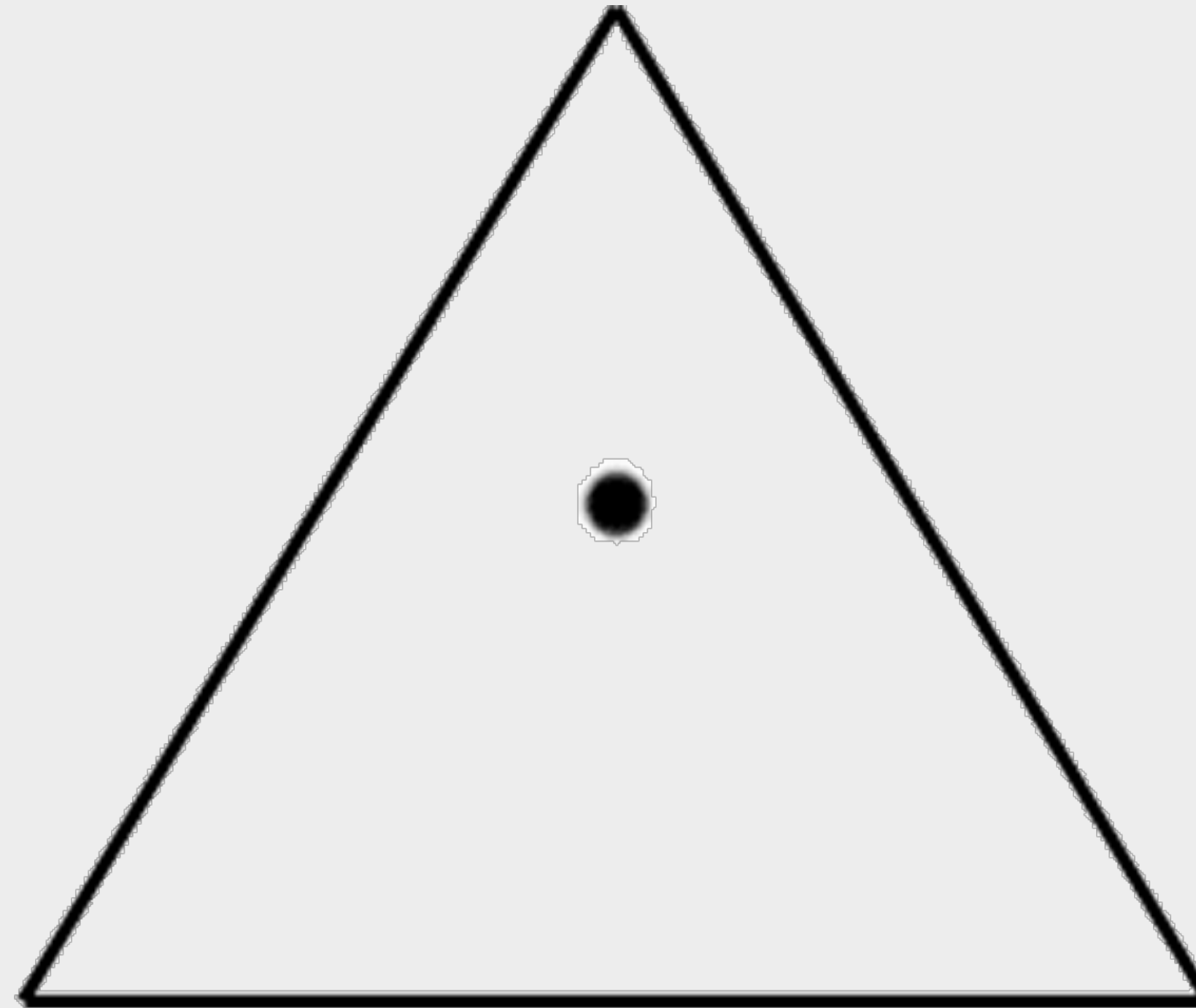


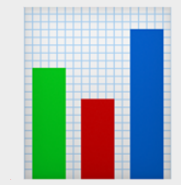
# Why should you analyze images with computers?

---



Is the dot half-way up?

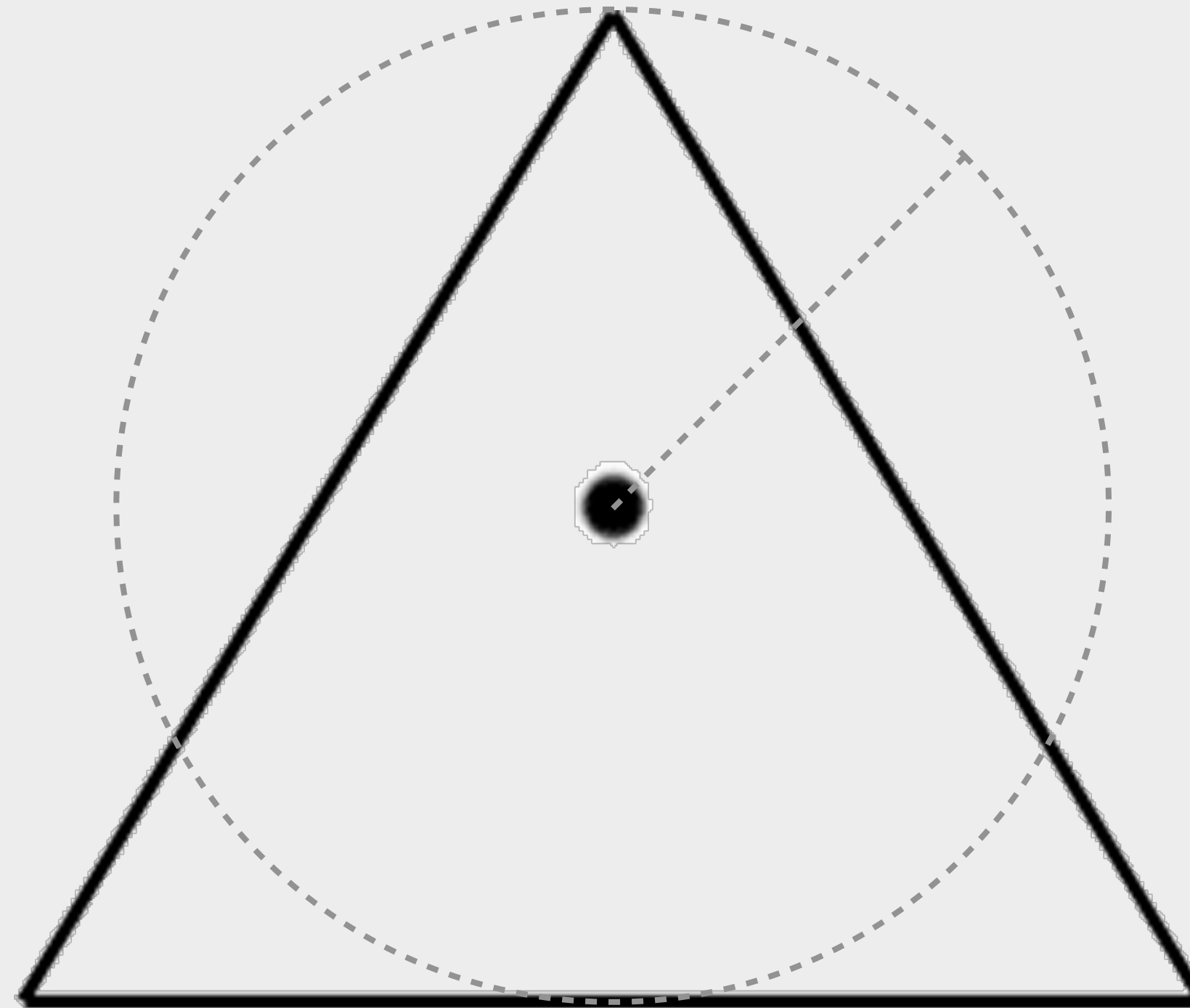




# Why should you analyze images with computers?



Is the dot half-way up?



our sense of distance depends on neighborhood.

<http://www.brainbashers.com>





# Why should you analyze images with computers?

---



are discs equally grey?





# Why should you analyze images with computers?

---



are discs equally grey?



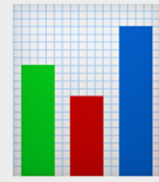
intensity perception depends strongly on neighborhood.

<http://www.brainbashers.com>









# Why should still use your brain?

---

