Computervision Lab 3
Morphological Operations

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1 Morphological operations

In this lab we see some operators that change the shape of objects. The two basic operations are erosion and dilation. Erosion is an operation in which the edges of objects are worn down. Dilation is the reverse operation: objects grow. Here an " object " is seen as something that has a lighter color than the background.

A kernel is also used in these morphological operations. This kernel is binary. In erosion, the central pixel is replaced by the darkest pixel of the environment defined by the non-zero values of the kernel. In dilatation, the central pixel is replaced by the lightest pixel of this environment. You can also erode and dilate asymmetrically by using elongated kernels.

Based on these two basic operators, two derivative operations are also defined: opening and closing. Opening is an erosion followed by a dilatation; this results in narrow connections being broken. Closure is a dilation followed by an erosion. As a result, small holes are filled up, and bridges are made over narrow gaps.

Figure 1: Original image (left), after erosion (central) and dilatation (right).

Figure 2: After opening (left) and closing (right).

2 Exercise 7

Write a program that converts the image **rainbowdiscs.png** as shown in the figure below. To avoid hard-coded paths, the filename is still given through the command line. New functions: **erode, dilate, getStructuringElement**.

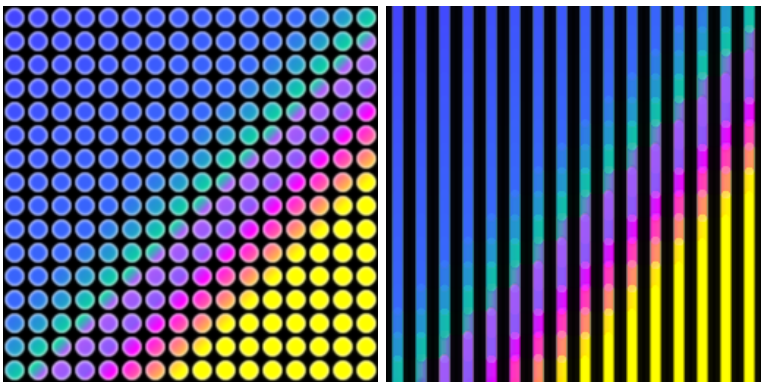

Figure 3: Original image (left) and target image (right).

3 Report

Write a short report about how you solved the exercises. Include in this report your input and output images. Describe every new function that you used. Explain the basic algorithm and purpose of the functions and clarify the parameters and how you selected them. Upload your report in the form of **LabX_name.pdf** to the dropbox on Minerva.