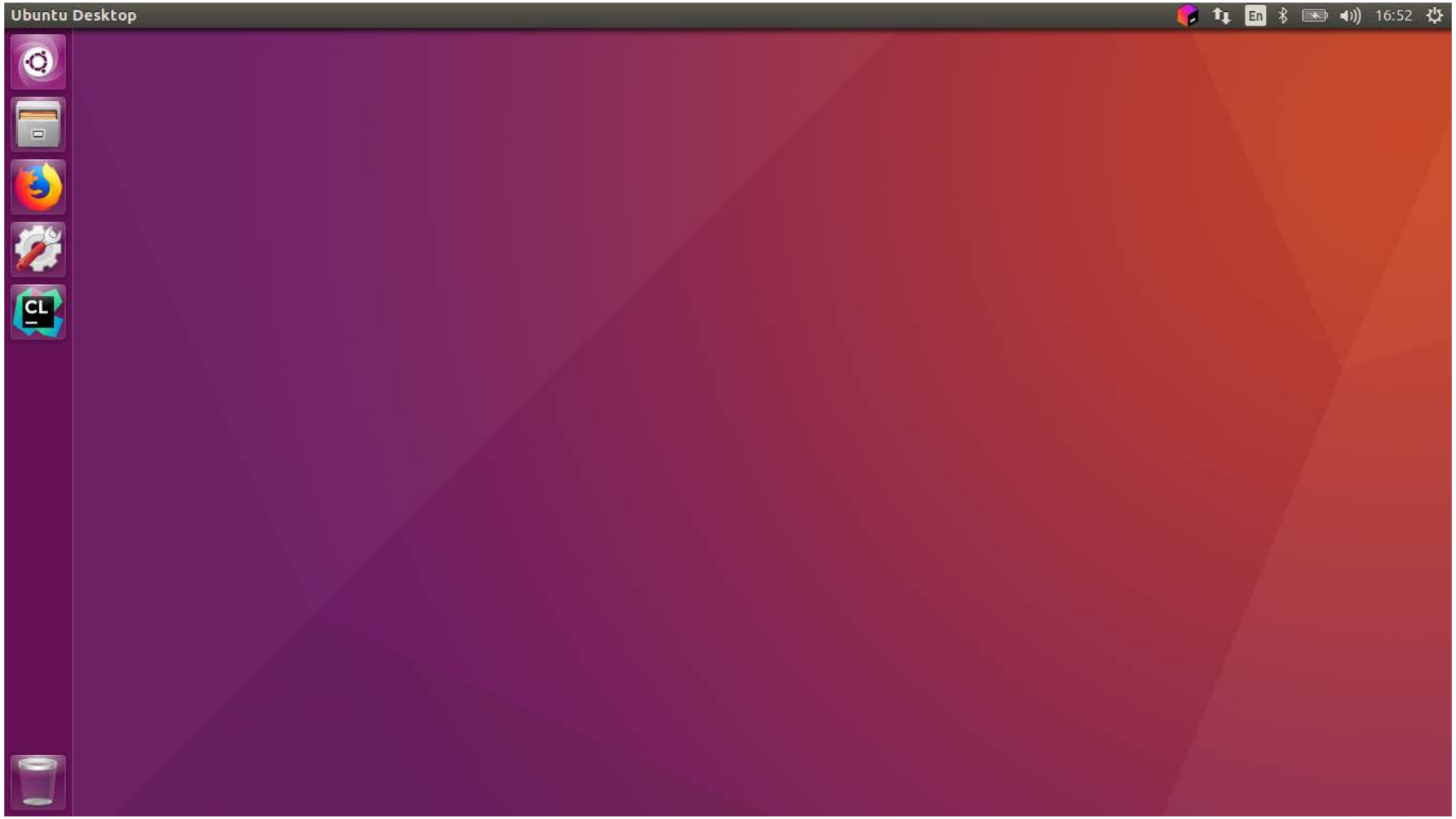
Lab 0 – Introduction to OpenCV

Lab

- Small projects each week
- Groups of ~2 students

- Status
  - Linux
  - C++
  - Personal computers
    - Operating systems

Part 1: Open the project in CLion



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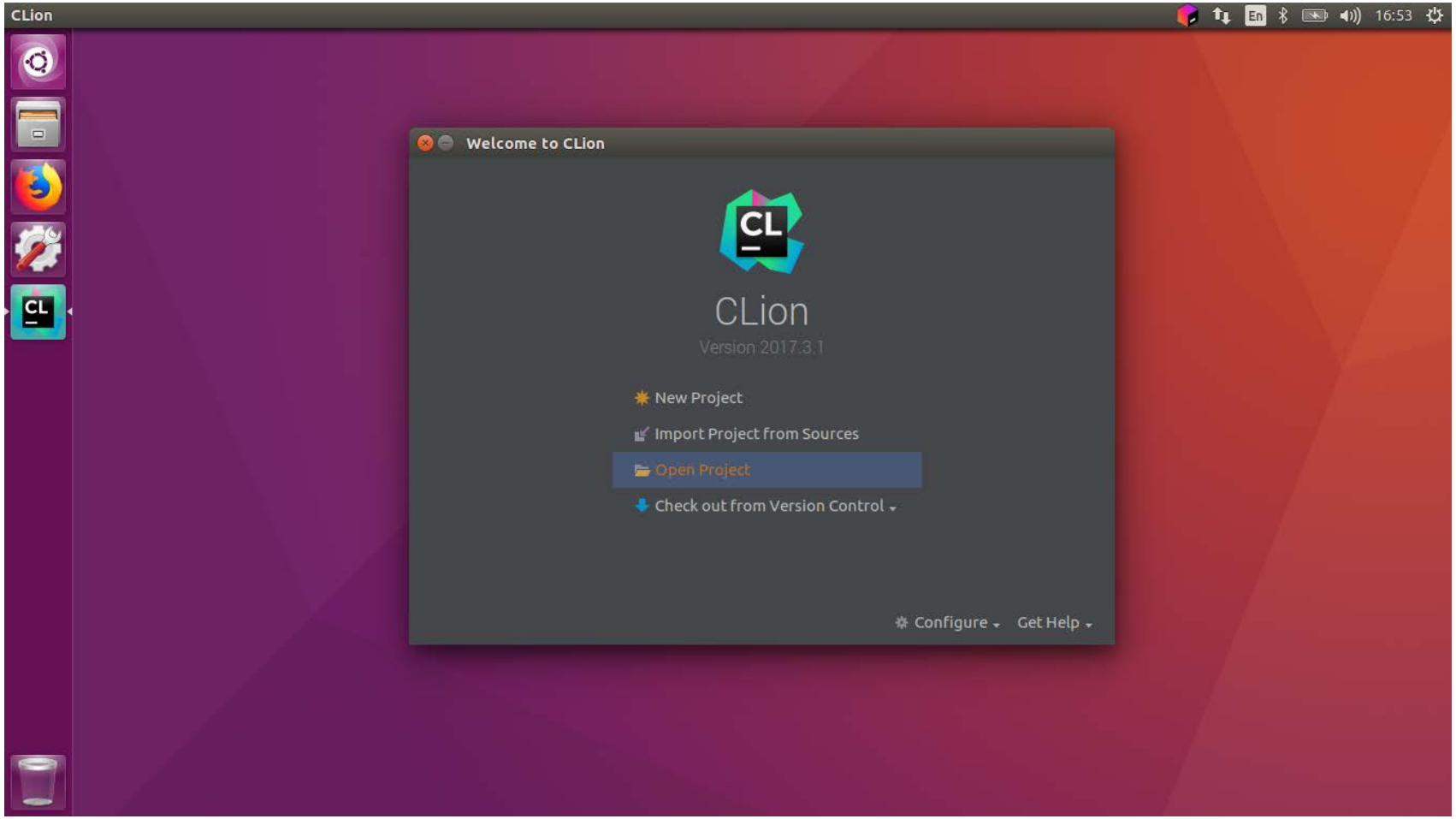

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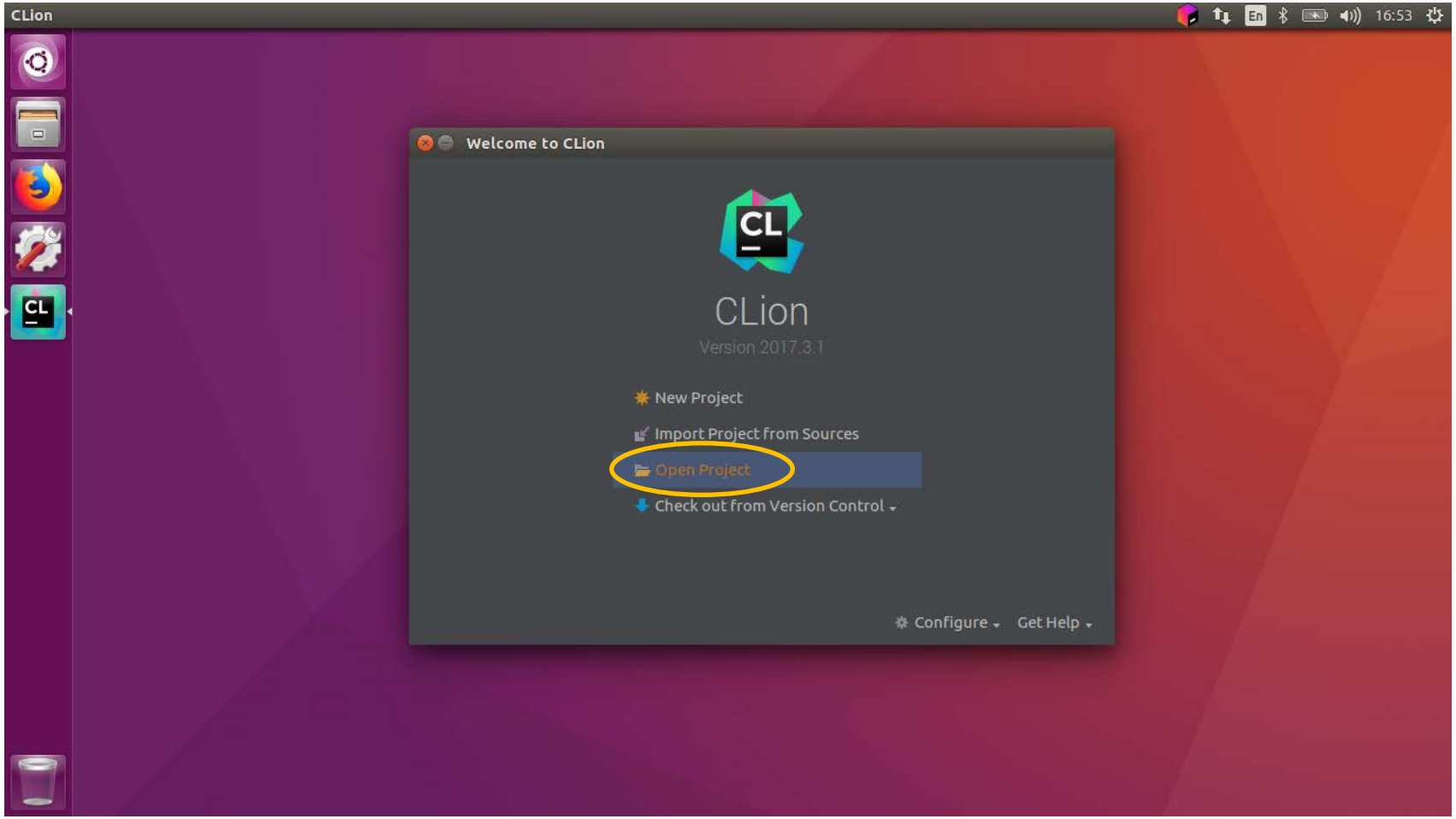

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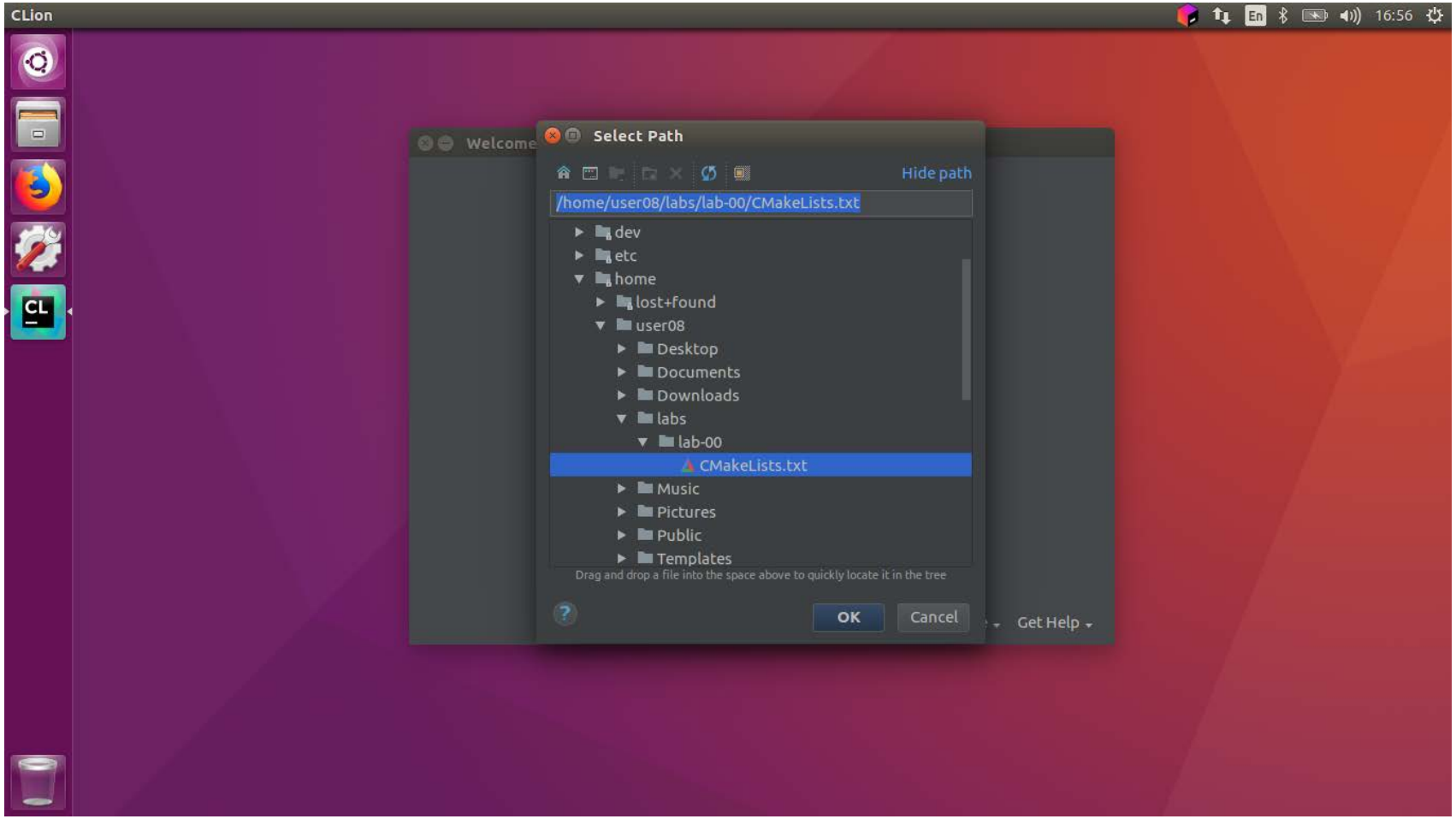

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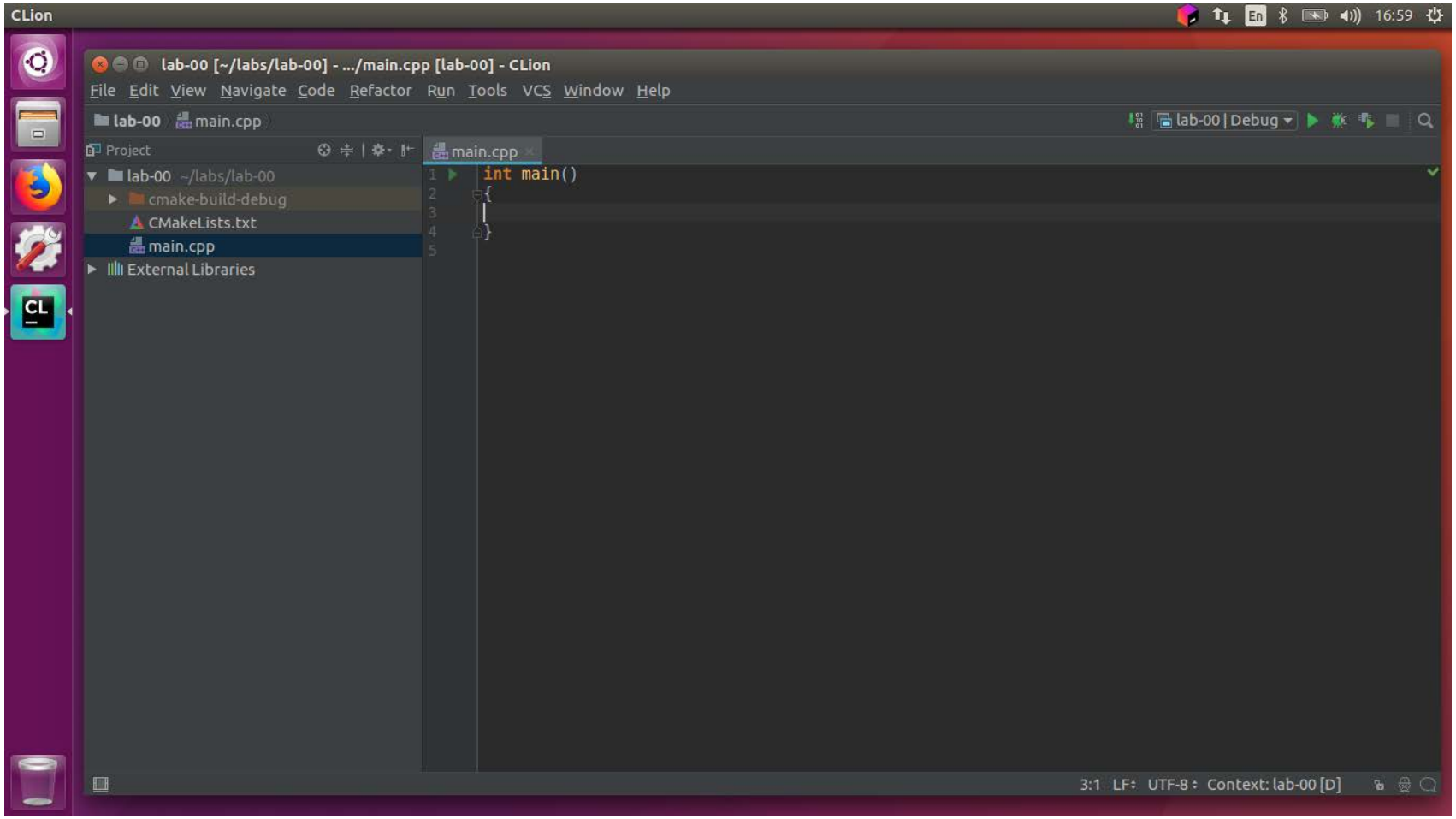
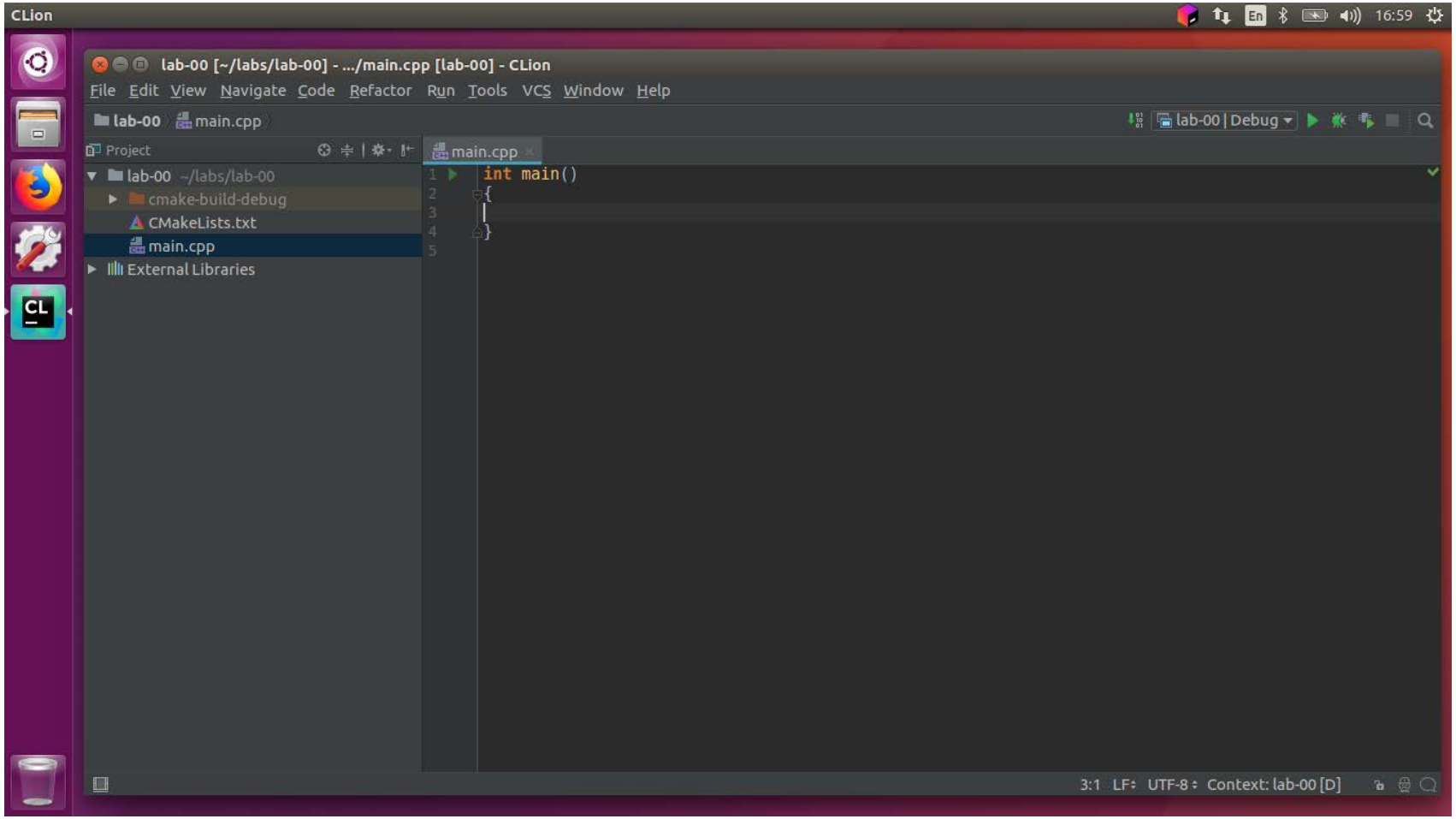


Part 2: Acquire and display live video



Part 2: Acquire and display live video

```cpp
#include "opencv2/highgui.hpp"
#include <iostream>

int main()
{
    cv::VideoCapture input_stream(0);

    if (!input_stream.isOpened())
    {
        std::cerr << "Could not open camera\n";
        return EXIT_FAILURE;
    }

    const std::string window_title = "Lab 0: Introduction to OpenCV";
    cv::namedWindow(window_title, cv::WINDOW_NORMAL);

    cv::Mat frame;

    while(true)
    {
        input_stream >> frame;

        if (frame.empty())
        { break; }

        cv::imshow("cam", frame);

        if (cv::waitKey(15) >= 0)
        { break; }
    }

    return EXIT_SUCCESS;
}
```

Part 3: Processing live video

- Process each **`frame`** and display the result!

- A few suggestions:
  - **`cv:blur`** (https://docs.opencv.org/3.3.1/d4/d86/group__imgproc__filter.html)
  - **`cv:Canny`** (https://docs.opencv.org/3.3.1/dd/d1a/group__imgproc__feature.html)
  - Take the difference between two successive images (https://docs.opencv.org/3.3.1/d2/de8/group__core__array.html)
- Play!
  - Take a look at the OpenCV-documentation (https://docs.opencv.org/3.3.1/)
  - Try the OpenCV tutorials (https://docs.opencv.org/3.3.1/d9/df8/tutorial_root.html)
    - The Core Functionality (core module)
    - Image Processing (imgproc module)

Useful resources

- C++
  - C++ reference http://en.cppreference.com/w/
- OpenCV
  - Documentation: https://docs.opencv.org/3.3.1/
  - Tutorials: https://docs.opencv.org/3.3.1/d9/df8/tutorial_root.html
- Clion:
  - https://www.jetbrains.com/clion/documentation/
  - https://resources.jetbrains.com/storage/products/clion/docs/CLion_ReferenceCard.pdf