Augmented Reality Equation Plotter
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Motivation
- **Graphical Visualization** of an equation can often help better understand underlying trends of real variables.
- **Mobile Application** with the use of Android platform, OpenCV, Tesseract OCR, and Template Matching with a server to overlay a plot on top of user’s axes.
- **Typing** out a complex equation made easier
- **Decently Complex equations** can be solved including explicit equations composed of exponentials, polynomials, trigonometric functions, simple derivatives and integrals

Method

**Client Side**
- Equation Image Capture
- Query user for equation approval
- Canny Edge Detector
- Harris Keypoint Detector

**Server Side**
- Binarize Image
- Recursively Segment Image
- Template Match
- Form Equation String
- Create Plot Points

Future Work
- **Perspective Insensitive plotting**
- **Robust keypoint detection** for faster and efficient axis detection
- **Perspective Insensitive OCR** using RANSAC and VLFeat
- **Handwritten equation detection** capability by training an SVM.
- **3D plotting capability** by adding plot transformation and multiple variable equation detection
- **Interactive plot reading features** by allowing the user to place dots where the plot readings are needed
- **Detailed Confusion Matrix** for addressing all edge cases in character recognition

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