a. MATLAB program to app conversion

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1. MATLAB to iPhone and Android Made Easy. (Video)

- Description: Learn how to generate readable and portable C code from your MATLAB algorithms using MATLAB Coder™, and then integrate it into an iPhone or iPad app using Apple’s XCode IDE or into an Android device using the Android SDK. The app can then be executed on the simulator or downloaded onto a physical device. This session is geared toward algorithm engineers developing and testing algorithms in MATLAB who are looking to put algorithms on these mobile devices.

[MATLAB to iPhone and Android Made Easy - MATLAB (mathworks.com)](https://www.mathworks.com/videos/matlab-to-iphone-and-android-made-easy-107779.html)

2. Migrating MATLAB® to Python: Strategies, Comparisons, and a Guide to Converting for Experts. (PDF)

- Summary: This white paper provides guidance for transitioning from MATLAB® to Python. It highlights differences between the two languages, fundamental data types, organizing code in packages, syntax, indexing, and more. The document also offers strategies for gradual migration and covers common tasks in data analysis and simulation using Python.

[Enthought-MATLAB-to-Python-White-Paper\_.pdf](https://www.enthought.com/wp-content/uploads/2019/08/Enthought-MATLAB-to-Python-White-Paper_.pdf)

3. MATLAB Applications in Engineering. (PDF)

- Summary: Although not specific to microrobots, this book addresses specialists interested in the applications of MATLAB. It covers data analysis, algorithm development, and model creation—skills essential for converting MATLAB programs into user-friendly apps.

[(PDF) MATLAB Applications in Engineering (researchgate.net)](https://www.researchgate.net/publication/358537759_MATLAB_Applications_in_Engineering)

4. How to Use an Existing MATLAB Code to Convert It into GUI Using App Designer. (Thread)

- Summary: If you’ve already written a MATLAB code and need to create a GUI using App Designer, this forum thread provides insights. Learn how to accomplish this task step by step, even if you’re new to App Designer.

[How to use an existing matlab code to convert it into GUI using App Designer in MATLAB? - MATLAB Answers - MATLAB Central (mathworks.com)](https://www.mathworks.com/matlabcentral/answers/416555-how-to-use-an-existing-matlab-code-to-convert-it-into-gui-using-app-designer-in-matlab)

b. Breathing Training Applications using Computer Vision

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1. Lungy App: Next-Gen Breathing Exercises. (App)

- Summary: The Lungy App is a next-generation breathing exercises app that responds to your breath using computer vision. It recognizes and adapts to your breathing patterns, creating real-time audiovisual experiences. With nature-inspired visuals, Lungy helps users stay present and mindful during breathing exercises. Whether you’re relaxing, meditating, or training your breath, Lungy provides a beautiful and calming experience.

[Lungy App: Next-Gen Breathing Exercises](https://www.lungy.app/)

2. Breathing Detection Using Computer Vision with Webcam. (Article)

- Summary: Inspired by research, this work tracks color variations on the human face to detect breathing. By monitoring subtle skin color changes caused by blood circulation and respiration, the system detects breath patterns. While not specifically a research paper, this practical approach demonstrates how computer vision can be applied to breathing detection.

[Breathing Detection Using Computer vision with webcam - DEV Community](https://dev.to/zqiu/breathing-detection-using-computer-vision-with-webcam-525g)

3. A Real-Time Camera-Based Adaptive Breathing Monitoring System. (PDF)

- Summary: This research introduces an improved real-time camera-based adaptive breathing monitoring system. The system includes adaptive breathing motion detection, region of interest (ROI) detection to eliminate environmental noise, breathing and body movement classification, respiration rate estimation, and online adaptation to lighting. It does not impose positional or postural constraints, making it suitable for various scenarios. The proposed method correlates significantly with an existing FDA-approved invasive medical system for patient monitoring, producing alarms earlier than the benchmark device.

[A real-time camera-based adaptive breathing monitoring system | Medical & Biological Engineering & Computing (springer.com)](https://link.springer.com/article/10.1007/s11517-021-02371-5)

4. Evaluating mobile apps for breathing training: The effectiveness of visualization. (PDF)

- Summary: In this academic paper, the authors investigate the effectiveness of different mobile app designs for breathing training. They compare three designs: one with audio-only instructions, one with a circle-based visualization, and one with a wave-based visualization. The study involves 68 participants who rated their perceived effectiveness and preference for each design. Results show that the wave-based visualization is more effective than the audio-only design, both objectively (measured depth of breath) and subjectively (users’ preferences). The paper highlights the potential of visualizations in enhancing breathing training apps.

<https://www.researchgate.net/publication/264981115_Evaluating_mobile_apps_for_breathing_training_The_effectiveness_of_visualization>