

Jigsaw Puzzle Solving Guide on Mobile Devices

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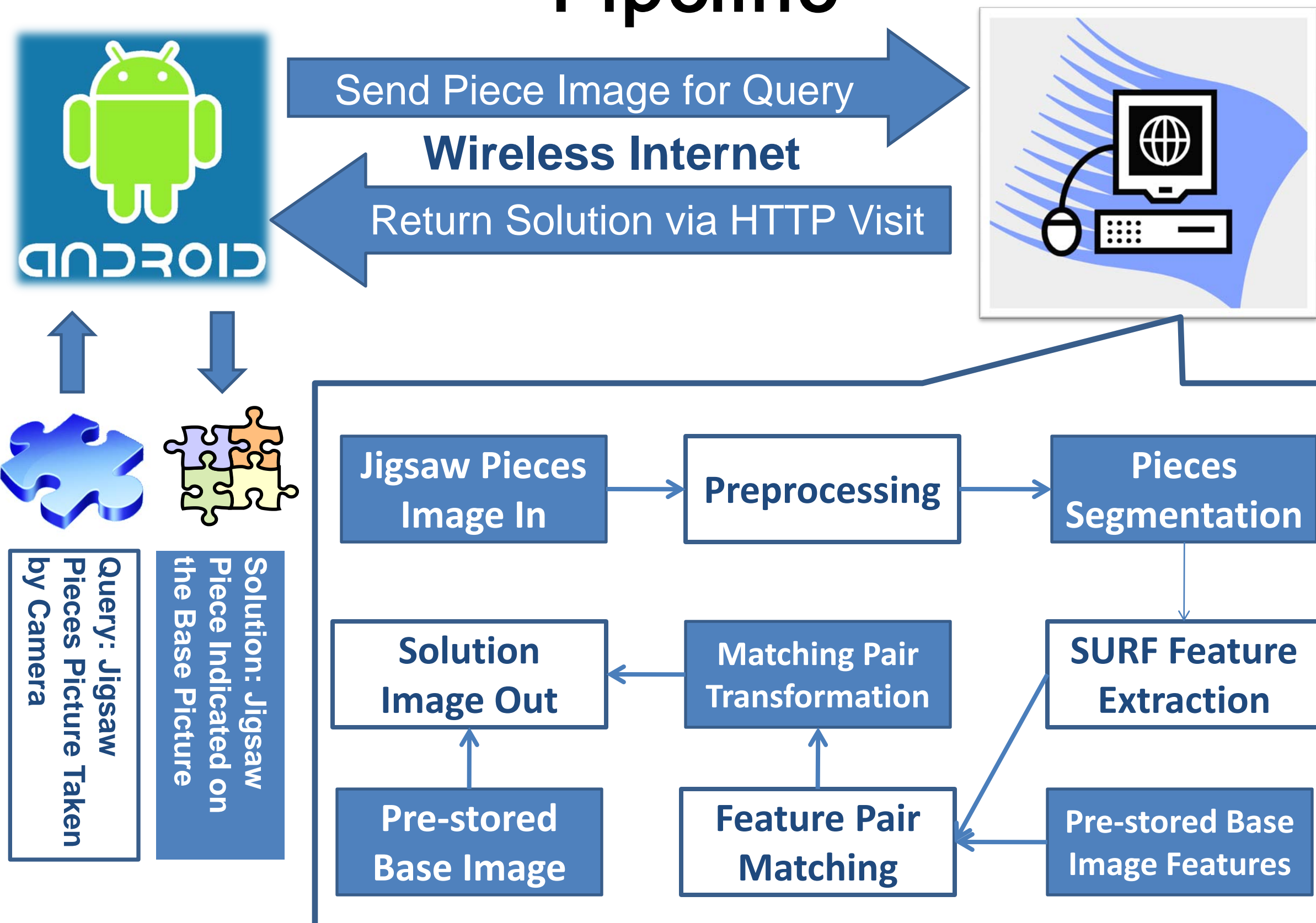
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Overview

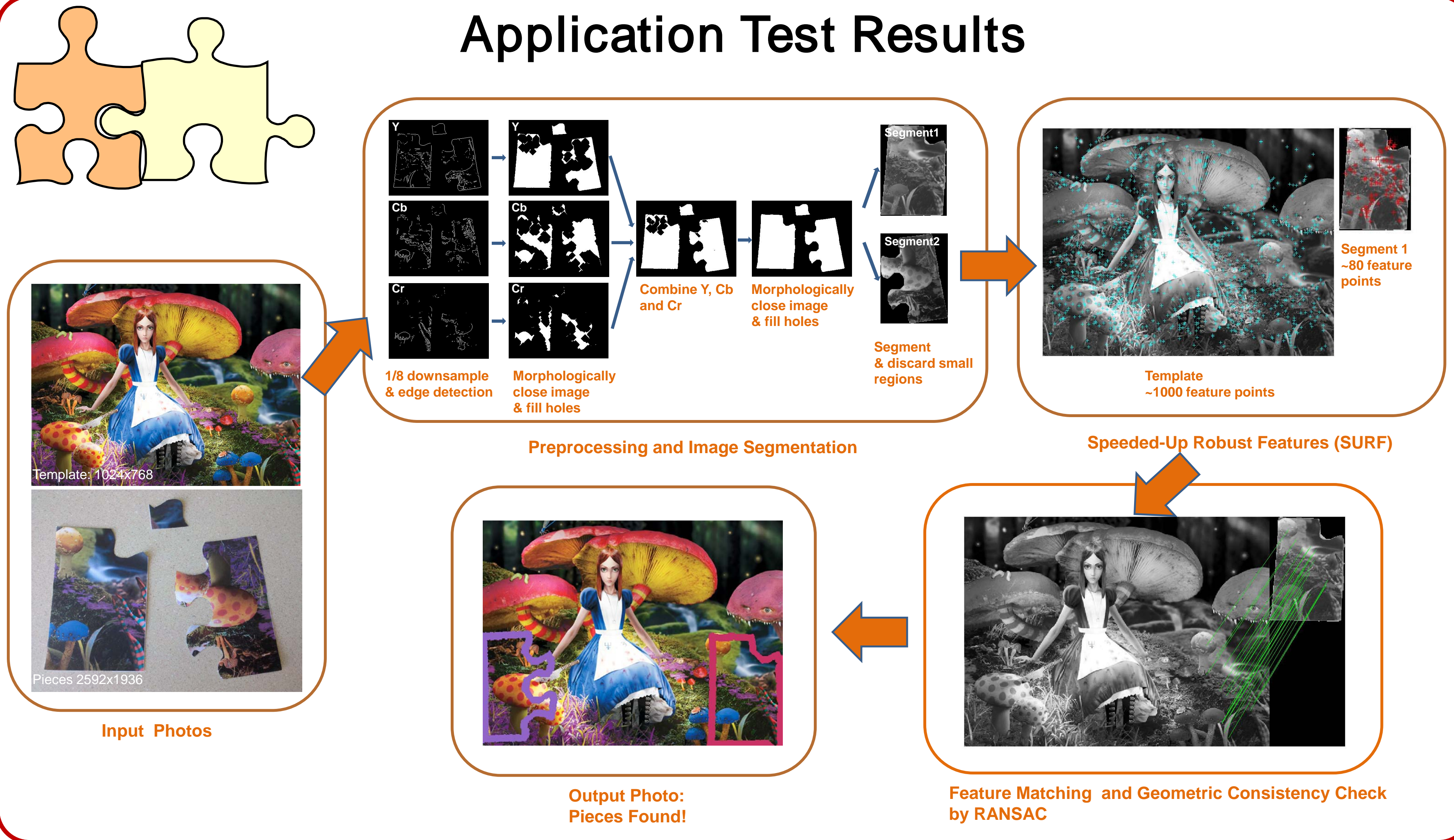
- **Objective:** design and implement a **mobile application** that guides people solve **jigsaw puzzles**
- **Challenge:**
 - Image Imperfection:** background noise, scaling, rotation and perspective distortion
 - Mobile phone Implementation:** user-friendly interface, balanced speed and performance



Pipeline



Application Test Results



System Performance

Typical Identified Piece Size	1.5 inch by 1.5 inch
Typical Processing Time	<5 secs
Robustness Against Rotation	Yes
Robustness Against Camera Distance and Angle	Yes

Discussion

- Templates and pieces with more features have a higher chance of detection and are more robust against distortion.
- May combine with other algorithms (SIFT, correlation) to compensate SURF method.

References

- Herbert Bay, Tinne Tuytelaars and Luc Van Gool "SURF: Speeded Up Robust Features", Proceedings of the 9th European Conference on Computer Vision, Springer LNCS volume 3951, part 1, pp 404--417, 2006.
- Herbert Bay, Andreas Ess, Tinne Tuytelaars and Luc Van Gool "SURF: Speeded Up Robust Features", Computer Vision and Image Understanding (CVIU), Vol. 110, No. 3, pp. 346--359, 2008.
- Petter Strandmark. "SURFmex: A MATLAB SURF interface". <http://www.maths.lth.se/matematikth/personal/petter/surfmex.php>
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