

Rubik's Cube Algorithms Compilation

Spencer T. Parkin

February 5, 2018

Explanation

This document is a compilation of algorithms for the 3x3 Rubik's Cube; most notably those for solving the last layer (LL) using the CFOP (Cross, F2L, Orient, Position) method. Most were taken from <https://www.speedsolving.com/>.

2-Look OLL Algs

First Look (Orient Edges)

Bar: $F (R U R' U') F'$

Corner: $f (R U R' U') f'$

None: $[F (R U R' U') F'] [f (R U R' U') f']$

Second Look (Orient Corners)

Fish UL: $(R' U' R) U' (R' U^2 R)$

Fish LL: $(R U R' U') U (R U^2 R')$

Double Head-lights: $F (R U R' U')^3 F'$

Head-lights/Camilian: $(R U^2)(R^2 U')(R^2 U')(R^2 U^2 R)$

Head-lights: $(R^2 D)(R' U^2)(R D')(R' U^2 R')$

Camilian: $(r U R' U')(r' F R F')$

Bow-tie: $F' (r U R' U')(r' F R)$

1-Look PLL Algs

Permute Edges

H-Perm: $M2\ U\ M2\ U2\ M2\ U\ M2$
U Perm (a): $R2\ U'\ R'\ U'\ R\ U\ R\ U\ R\ U'\ R$
U Perm (b): $R'\ U\ R'\ U'\ R'\ U'\ R'\ U\ R\ U\ R2$
Z Perm: $(M2\ U)2\ M'\ (U2\ M2\ U2)\ M'\ U2$

Permute Corners

A Perm (a): $R'\ F\ R'\ B2\ R\ F'\ R'\ B2\ R2$
A Perm (b): $R\ B'\ R\ F2\ R'\ B\ R\ F2\ R2$
E Perm: $L\ R'\ U'\ R\ U\ L'\ U'\ R'\ U\ R\ r\ U\ R'\ U'\ r'\ F\ R\ F'$

Permute Edges/Corners

F Perm: $(R'\ U\ R\ U')\ R2\ (F'\ U'\ F\ U)(R\ F\ R'\ F')\ R2\ U'$
G Perm (a): $(R\ U\ R'\ U'\ R')\ U\ F\ (R\ U\ R\ U'\ R')\ F'\ U\ R'\ U2\ R$
G Perm (b): $R'\ U'\ R\ B2\ D\ (L'\ U\ L\ U'\ L)\ D'\ B2$
G Perm (c): $L'\ U'\ L\ U\ L\ U'\ F'\ L'\ U'\ L'\ U\ L\ F\ U'\ L\ U2\ L'$
G Perm (d): $U2\ R\ U\ R'\ F2\ D'\ (L\ U'\ L'\ U\ L')\ D\ F2\ U2$
J Perm (a): $(B'\ U\ F')\ U2\ (B\ U'\ B')\ U2\ (F\ B\ U')$
J Perm (b): $(B\ U'\ F)\ U2\ (B'\ U\ B)\ U2\ (F'\ B'\ U)$
N Perm (a): $(L\ U'\ R\ U2\ L'\ U\ R')2\ U'$
N Perm (b): $(R'\ U\ L'\ U2\ R\ U'\ L)2\ U$
R Perm (a): $R\ U2\ R'\ U2\ R\ B'\ R'\ U'\ R\ U\ R\ B\ R2\ U$
R Perm (b): $R'\ U2\ R\ U2\ R'\ F\ (R\ U\ R'\ U')\ R'\ F'\ R2'\ U'$
T Perm: $R\ U\ R'\ U'\ R'\ F\ R2\ U'\ R'\ U'\ R\ U\ R'\ F'$
V Perm: $R'\ U\ R'\ U'\ B'\ R'\ B2\ U'\ B'\ U\ B'\ R\ B\ R$
Y Perm: $F\ R\ U'\ R'\ U'\ R\ U\ R'\ F'\ R\ U\ R'\ U'\ R'\ F\ R\ F'$

1-Look OLL Algs

TODO: Add them here by category.