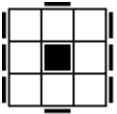
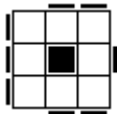
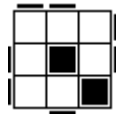
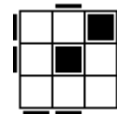
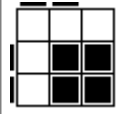
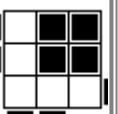
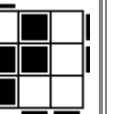
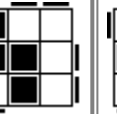
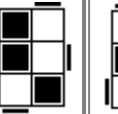
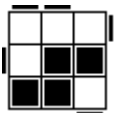
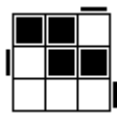
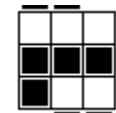
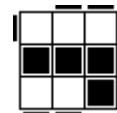
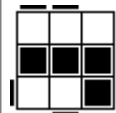
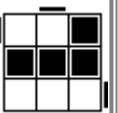
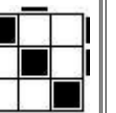
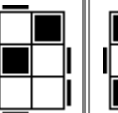
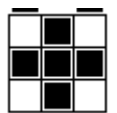
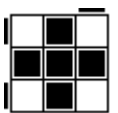
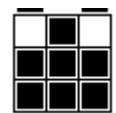
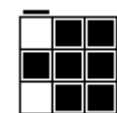
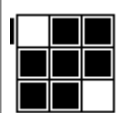
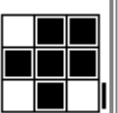
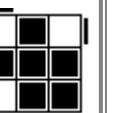
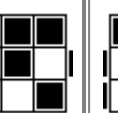
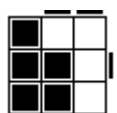
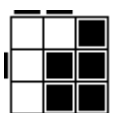
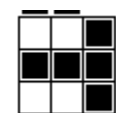
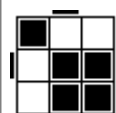
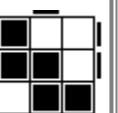
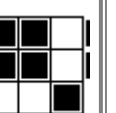
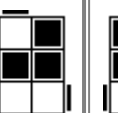
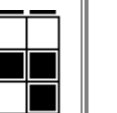


OLL 手法

Gan

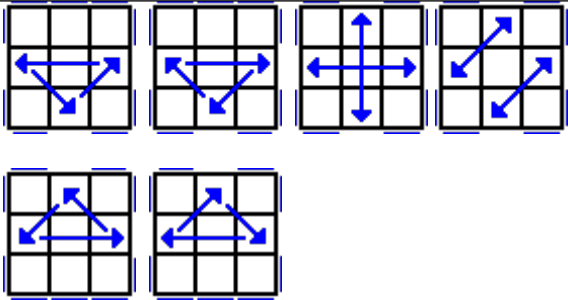
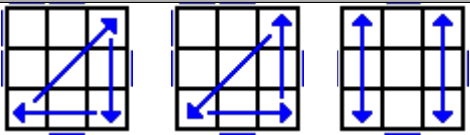
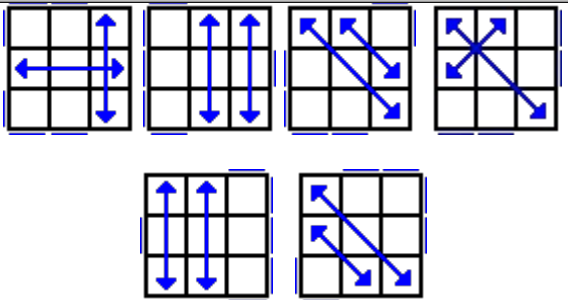
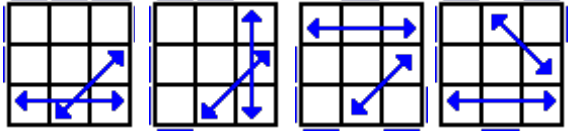
1  (R U' <u>U</u>) (R2' F R F') U2 (R' F R F')	2  (F R U R' <u>U</u>' F') (f R U R' <u>U</u>' f')	3  f(R U R' <u>U</u>')f' <u>U</u>' F(R U R' <u>U</u>')F'	4  f(R U R' <u>U</u>)y x(R' F)(R U R' <u>U</u>')F'	5  (r' U2) (R U R'U) r	6  (r U' <u>U</u>) (R' <u>U</u>' R U' r')	7  r U R' U R U' <u>U</u>' r'	8  r' <u>U</u>' R U' R' U2 r	9  (R' U' R) y' x' (R <u>U</u>) (R'F) (R U R')	10  (R U R'U)(R'F R F') (RU' <u>U</u>'R')
11  r'(R2 U R' U)(R U' <u>U</u>' R' U) (r R')	12  (r R'2 <u>U</u>' R U')(R' U2 R U' R)r'	13  (r <u>U</u>' r' <u>U</u>')(r U r') (F' U F)	14  R' F R U R' F'R (F <u>U</u>' F')	15  (r' <u>U</u>' r) (R' <u>U</u>'R U) (r' U r)	16  (r U r') (R U R' <u>U</u>) (r <u>U</u>' r')	17  F(U R' <u>U</u>'F')U (F R2 U R' <u>U</u>'F')	18  F (R U R' d)(R' U2) (R' F R F')	19  (r' R U)(R U R' U' r) (R'2 F R F')	20  r'(R U R U R' <u>U</u>' r2)(R2'U) (R <u>U</u>) r'
21  (R U' <u>U</u>) (R' <u>U</u>' R U R' U') (R <u>U</u>' R')	22  R U' <u>U</u>' (R'2 <u>U</u>) (R2 <u>U</u>) R'2 <u>U</u>' U'R	23  (R2 D') (R U' <u>U</u>) (R' D) (R U' <u>U</u>' R)	24  (r U R' <u>U</u>) (r' F R F)	25  F(r U R' <u>U</u>) (r' F R)	26  R U' <u>U</u>' R' <u>U</u>' R <u>U</u>' R'	27  R' U2 R U R' U R (R U' R')	28  (r' R U) (R U' R')	29  (r U R' U') (R r'2 F R F') (r R')	30  (R2 U R' B')(RU') (R2' U) (R B R')
31 	32 	33 	34 	35 	36 	37 	38 	39 	40 

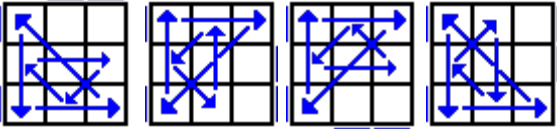
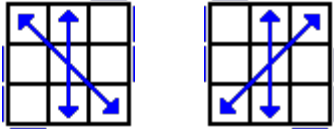
$(r' F U F)$ $(L F'$ $L' U' r)$	$(R U)(B' U')$ $(R' U R B$ $R')$	$(R U R' \underline{U})$ $(R' F R F')$	$(R \underline{U}' R U)$ $y(r U R'$ $\underline{U}')r' R$	$R U \underline{U}' R 2'$ $F R F'(R$ $U' \underline{U}' R')$	$R' \underline{U}' R U'$ $R' U R U$ $I \underline{U}' R' U$	$F (R \underline{U}'$ $R' \underline{U}' R U)$ $(R' F')$	$(R U R' U)$ $(R \underline{U}' R' \underline{U})$ $(R' F R F')$	$(r \underline{U}' r' \underline{U}'$ $r)y(R U R'$ $f)$	$(R' F R U$ $R' \underline{U}')$ $(F' U R)$
41 $R U' R' U 2$ $R U y R \underline{U}'$ $R' \underline{U}' F'$	42 $(R' U R$ $U' \underline{U}' R' \underline{U}')$ $(F' U)(F U$ $R)$	43 $(B' \underline{U}')$ $(R' U R B)$	44 $f (R U$ $R' \underline{U}')f'$	45 $F (R U R'$ $\underline{U}') F'$	46 $(R' \underline{U}')$ $R' F R F'$ $(U R)$	47 $B'(R' \underline{U}'$ $R U) 2 B$	48 $F (R U R'$ $\underline{U}') 2 F'$	49 $R B'(R 2 F)$ $(R 2 B)$ $R 2 F' R$	50 $L' B (L 2 \underline{F}')$ $(L 2 \underline{B}')$ $L 2 F L'$
51 $f (R U R'$ $\underline{U}') 2 f'$	52 $R' \underline{U}' R \underline{U}'$ $R' d$ $R' U I U$	53 $(r' U 2)$ $(R U R' \underline{U}')$ $(R U R' U)$ r	54 $(r U \underline{U}')$ $(R' \underline{U}' R U$ $R' \underline{U}')$ $(R U' r')$	55 $(R U \underline{U}')$ $(R' 2 \underline{U}')$ $R U' R' U 2$ $(F R F')$	56 $F (R U$ $R' \underline{U}')(R$ $F')(r U$ $R' \underline{U}')r'$	57 $(R U R' \underline{U}'$ $r)(R' U)$ $(R U' r')$			
42' $(r' R 2)y$ $(R U R' \underline{U}')$	47' $b' \underline{U}'$ $(R' U R \underline{U}'$	10' $(L U L')$ y'	5' $(I' U 2)$ $(L U L' U I)$	6' $I U 2$ $L' U' L U'$	3' $(r' R 2 U$ $R' U)(r$	12' $F (R U R'$ $U') y L' F$	13' $I \underline{U}' R' F'$ $R U I'$		

$(R' U R')r$	$R' U R)b$	$(R' F R \underline{U}')$		I'	$U2)(r' U$	$(R U R'$	$y R' U R$		
		$(R' F' R)$			$r R')$	$U') F'$			

PLL 手法

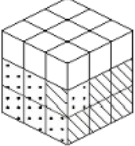
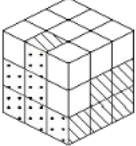
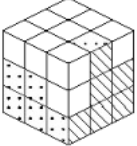
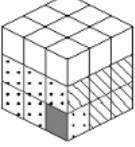
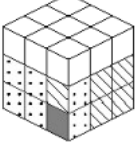
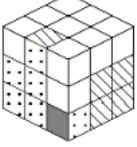
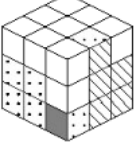
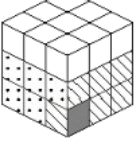
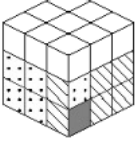
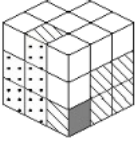
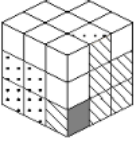
Gan

棱换		01. $(R' U' R)(U R U R)(\underline{U}' R' \underline{U}' R2)$ 02. $(R2' U)(R U R' \underline{U}')(R' \underline{U}')(R' U R')$ 03. $M2 U M2 U2 M2 U M2$ 04. $(U R' \underline{U}')(R \underline{U}' R)(U R \underline{U}')(R' U R U)(R2 \underline{U}')(R' U)$ 01'. $(R2 \mathcal{U})(R' \underline{U}' R U R U)(R \mathcal{U}' R)$ 02'. $(R' U R' \underline{U}')(R' \underline{U}')(R' U)(R U R2)$
角换		05. $x' R2 D2(R' \underline{U}' R)D2(R' U R')$ 06. $x'(R U' R)z'(R2 \underline{U}' L U R2' x y R2)$ 上式中的 $R2' x y$ 是同时进行的 07. $x'(R U' R' D)(R U R')u2'(R' U R)D(R' \underline{U}' R)$
邻角 对棱 对角 邻棱		08. $(R U R' \underline{U}')(R' F)(R2 \underline{U}' R' \underline{U}')(R U R' F')$ 09. $\underline{U}'(R' U R \underline{U}' R2 b)x(R' U R)y'(R U R' \underline{U}' R2)$ 10. $(R' U R' \underline{U}')yx2(R' U R' \underline{U}' R2)xz'(R' \underline{U}' R U R)$ 11. $F(R \underline{U}' R' \underline{U}')(R U R' F')(R U R' \underline{U}')(R' F R F')$ 09'. $z(R U R' \underline{U}' R \mathcal{U}' \underline{U}')(x' z')(R U R' \underline{U}')$ $x(\underline{U}' R' U R \mathcal{U}' \underline{U}')$ 10'. $z(U' R U' I')z(R' U R' U')(I R)$ $(U' R' U R U)$
邻角 邻棱 换		12. $z(\underline{U}' R D')(R2 U R' \underline{U}' R2 U)z'(R U')$ 13. $(R U R' F')(R U R' \underline{U}')(R' F R2 \underline{U}' R' U')$ 14. $(R' U2)(R U \underline{U}')(R' F R U R' \underline{U}')(R' F' R2 \underline{U}')$

		15. (R U' <u>U'</u>)(R' U2)(R <i>B'</i> R' <u>U'</u>)(R U R B R2' U)
三角 三棱 换		16. (R2' <u>u</u> R U' R)(U R' u)(R2 <i>f</i> R' <i>f</i>) 17. (R U R')y'(R2' u' R U')(R' U R' u R2) 18. (R2 u)(R' U R' <u>U'</u>)(R u') (R2' <i>F</i> U <i>f</i>) 19. (R' d' F)(R2 u)(R' U)(R U' R <u>u</u> R2)
对角 对棱 换		20. z(R' U R')z'(R U2 <u>L'</u> U R') z(U R')z'(R U2 <u>L'</u> U R') 21. z(<u>U'</u> R D')(R2 U R' <u>U'</u>)z'(R U R') z(R2 U R')z'(R U')
说明	符号系统：RLUDBF, rludfb(转两层) 如 u 就是上两层顺时针转 90 度 x(整个魔方以 R 的方向转动), y(整个魔方以 U 的方向转动), z(整个魔方以 F 的方向转动), 斜体是用右拇指 下划线用左食指	

-*F2I 手法

Gan

			
(R <i>U'</i> <u>U'</u> R' U)2 y'(R' <u>U'</u> R)	(U R <u>U'</u> R' <u>U'</u>) y'(R' U R)	(R' <i>F</i> RU)(R <i>U'</i> R' F) U'(F'RUR'U')(R'FR)	
			
(R U R' U')(R <i>U'</i> <u>U'</u> R' U')(R U R')	(R U' R U)y(R U' R' F2)	y'(R' <u>U'</u> R U)(R' <u>U'</u> R)	(R U' R' U)(R U' R')
			
(RU'R'U)(R <i>U'</i> <u>U'</u> R'U)(RU'R')	R2 y(R U R' <u>U'</u>)y'(R' U R')	y' (R' U)(R <u>U'</u>)(R' U R)	(R U R' <u>U'</u>)(R U R')

$(R\ U\ R'\ \underline{U})^2\ (R\ U\ R')$	$(R\ \underline{U}'\ R')\ y'\ (R'\ U^2\ R)$		
$y'\ (R'\ U^2)\ (R\ U\ R'\ \underline{U})\ R$	$y'\ \underline{U}'\ (R'\ U^2)\ (R\ \underline{U}'\ R'\ U)\ R$	$y'\ (R'\ U\ R\ \underline{U}'\ \underline{U})\ (R'\ \underline{U}'\ R)$	$y'\ (U^2\ R^2\ U^2)\ (R\ U\ R'\ U\ R^2)\ (R\ U\ R'\ U)\ (R\ \underline{U}'\ R'\ d)\ (R'\ U\ R)$
$(R\ U\ R')\ U^2\ (R\ U\ R'\ \underline{U}')\ (R\ U\ R')$	$(R\ U'\ R'\ U^2)\ (R\ U\ R')$	$U\ (R\ \underline{U}'\ \underline{U}')\ (R'\ U\ R\ U')\ R'$	$(R\ \underline{U}'\ \underline{U}')\ (R'\ \underline{U}'\ R\ U)\ R'$
$\underline{U}'\ (R\ \underline{U}')\ (R'\ U^2)\ (R\ U'\ R')$	$\underline{U}'\ (R\ U\ R')\ d\ (R'\ \underline{U}'\ R)$		
$d\ (R'\ U\ R\ U')\ (R'\ \underline{U}'\ R)$	$y'\ (R'\ \underline{U}'\ R)$	$(d\ R'\ \underline{U}'\ R\ U')\ (R'\ \underline{U}'\ R)$	$y'\ (R\ \underline{U}'\ \underline{U}')\ R'^2\ \underline{U}'\ R^2\ \underline{U}'\ R'\ U'\ (R\ \underline{U}'\ \underline{U}'\ R'\ d)\ (R'\ U'\ R)$
$y'\ (R'\ U)\ (R\ d'\ \underline{U}')\ (R\ U\ R')$	$U'\ (R\ \underline{U}'\ \underline{U}')\ (R'\ U^2)\ (R\ U'\ R')$	$U'\ (R\ U\ R'\ U')\ (R\ \underline{U}'\ \underline{U}'\ R')$	$U\ R\ U'\ R'$
$\underline{U}'\ (R\ \underline{U}'\ \underline{U}'\ R'\ U)\ (R\ U\ R')$	$d\ (R'\ U'\ R)\ d'\ (R\ U\ R')$		
$y'\ \underline{U}'\ (R'\ U\ R)$	$(d\ R'\ \underline{U}'\ R\ \underline{U}'\ \underline{U}')\ (R'\ U\ R)$	$d\ (R'\ U^2)\ (R\ \underline{U}'\ \underline{U}')\ (R'\ U\ R)$	$(R\ U'\ R'\ U)\ (d\ R'\ \underline{U}'\ R)$
$(R\ U')\ (R'\ U)\ (R\ U')\ (R'\ U^2)\ (R\ U'\ R')$	$\underline{U}'\ (R\ U\ R'\ U)\ (R\ U\ R')$	$(R\ U\ R')$	$\underline{U}'\ (R\ \underline{U}'\ R'\ U)\ (R\ U\ R')$

加下划线的是用左食指完成，斜体是用右拇指

浅蓝色的是最少步数版本

红色是新增的多解

新修正