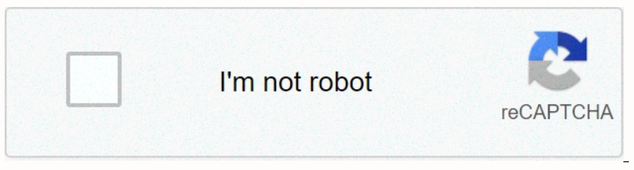

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The CFOP method (Cross - F2L - OLL – PLL), sometimes known as the Friedrich method, is one of the most commonly used methods for speedsolving 3×3×3 Rubik's Cube. This method was first developed in the early 1980s, combining innovations from a number of hub speeds. Czech speedkuber and method namesake Jessica Friedrich is generally well deserved for its promotion by publishing it online in 1997. The method works on a layer-by-layer system, first a decisive cross usually at the bottom, continues to solve the first two layers (F2L) oriented to the last layer (OLL) and finally permutates the last layer (PLL). History Basic layer-by-layer methods are among the first to emerge in the early 1980s cube madness. David Singh published a layer-based solution in 1980 that suggested the use of a cross. [2] The main innovation of CFOP over novice methods is the use of F2L, which solves both the first two layers at the same time. This step was not invented by Jessica Friedrich. According to Singmaster's report on the 1982 Rubik's Cube World Cup, Friedrich was used by the base layer method, while Dutch racer Guus Razu Schulz had a primitive F2L system. [3] The last steps of the OLL and PLL layers include first landmarking the last layer pieces and then permuting them in their correct positions. This step was proposed by Hans Dokhorn and AneKe Tripp. Friedrich switched to F2L later in 1982. Its main contribution to the method is the development of OLL and PLL algorithms, which together allowed each last layer of position to be solved with two algorithms and is significantly faster than the previous systems of the last layer. [4] CFOP, with small tweaks, is the most popular method that the best cubes use. Users include Mats Valk, Felix Zemdegs and Max Park. Cross method – This first stage involves solving the four extreme pieces in one outer layer of the puzzle, centering around a total colored central piece. Many speedcubers usually decide the cross on the underside to avoid the rotation of the cube and get a comprehensive better look at the important pieces needed for the next step. Transversely resolved (White at the bottom) The first two layers (F2L) – In F2L, the angular and end parts are paired and later moved to their correct place. There are 42 standard cases for each pair of angular edges, including the case when it is already solved. It can be done intuitively. The first two layers (F2L) solved Last Layer Orientation (OLL) – This stage involves manipulating the top layer so that all the pieces there have the same color on top, at the expense of incorrect colors from other sides. This stage includes a total of 57 algorithms. A simpler version called a two-faced OLL orients itself first with the edges and corners afterwards. Algorithms are usually performed two to three times for this version. Uses 10 algorithms, three orientation of the edge and seven for the corners corners Orientation of the last layer (OLL) full Permutation of the last layer (PLL) – The final stage involves moving the pieces from the top layer, while preserving their orientation. For this stage, there are a total of 21 algorithms. They are distinguished by letter names, usually based on what they look like, with arrows representing what figures are exchanged (e.g. permutation, F permutation, T permutation, etc.). Two-faced PLL solves the corners and edges separately first. It uses six algorithms, two for angular permutation and up to four for permutation. Also, U-perm can be repeated if the user wishes to use even fewer algorithms at the expense of usually faster resolution times. [5] There are also many advanced extensions to be used in a CFOP company, such as coll, Winter variations, VLS, ZBLL, etc. However, it is not necessary to teach them to solve the cube. Competitive CFOP use is heavily used and relies on many speedcubers, including Max Park and Felix Zemdegs, to rely on algorithms, model recognition and muscle memory, as opposed to more intuitive methods such as the Roo or Petrus methods. The majority of the best speed cubes in the WCA rankings are CFOP solvers, including the current 3x3x3 single world record holder (Yusheng Du (杜threst)), with a time of 3.47 seconds. [8] [9] References ^ Shotaro Macky Makysumi. Speed up literary shakes. cubefreak.net. Archived from the original of 2007-07-03. Retrieved 2007-08-31. Solution for a cube of the beginner Rubik's Cube. Archive of the original from September 26, 2015. Retrieved June 15, 2012. 1999 Cubic Circular Issue 3, Spring 1982. 1999 20 years of speeding up traffic. Retrieved June 15, 2012. Zemdeg, Felix. 2-look last layer. The cubic jokes. 3.47 World record ^ reconstruction of Yusheng Doo 3.47 solve the world record ^ WCA website team. World Cube Association - official results. worldcubeassociation.org. External links On jessica friedrich's official CFOP website method of Speedsolving.com Wiki all OLL and PLL algorithms can be found on How to solve the Rubik's Cube extracted from It's a super Rubik's Cube tutorial where you don't have to learn to move notation or long algorithms. With some practice, you should be able to solve the cube in about 2-4 minutes. If you want to get even faster, you need to learn how to do finger tricks and learn cfop method. Below are the steps from the video, for reference. Example Solve You can also watch the way the tutorial method solve in case something is unclear. If you have any additional questions, you can go to video and leave a comment that I try to answer best. Step 1. White cross turn the top with your right Make the right 4-stroke 4-stroke to face the right side 4-stroke Turn the top with your left hand Make the left 4-stroke Turn cube to face the left side 4-stroke Turn forward clockwise 4-move Turn the front counterclockwise The first 3 moves of the 4-move sequence. Look at a pair of pieces from the bottom. Watch them move, then back to the bottom. Turn the top with your right hand, then turn the right side up Turn the top with your left hand, then turn the left side upwards Repeat, but go down instead of twisting the entire cube to get the next corner of the bottom / right. Make sure you rotate only the bottom layer. Do not finish 4-moves, because the angle is solved after 3 moves. Make sure you always complete the 4-stroke. Congratulations on solving the Rubik's Cube! With practice, you should be able to do this for a few minutes or even less than 1 minute if you train a lot. Some people stop there, which is perfectly fine. But if you want to get even faster, you need to learn How to make finger tricks and learn the CFOP method that is most commonly used by the fastest cubes. My advice is that you should not rush to learn new things until you practice well with what you know, otherwise you may feel overwhelming. CFOP does have a lot of algorithms to remember, but don't be pressured to think that learning more algorithms is what makes you faster eventually. Cubing is much more interesting because it is not, and there is much more to learn besides algorithms. Check out my under-11 second average using a total of 16 algorithms, which is part of what you learn with beginner CFOP. People who share the hobby There is an active community of cubes with hundreds of thousands of people who just enjoy speedsolving and/or solving different puzzles! You can find us on Reddit, Facebook, SpeedSolving forums and other decentralized places like YouTube and Instagram. The Cube World Association (WCA) processes Cuba events and official records. You can use their website to check world records and search for races near you. Maybe you're thinking races! Races are actually just events where cubes can meet and go out (and make some official decides). No one has said they ever regret going, and most people (including myself) regret not being early enough. I strongly encourage them to check it out. Although I highly recommend it, you don't need to subscribe to my YouTube channel. But if you ever have a question about something, feel free to leave a comment on one of my videos! I'm trying to answer questions. F2L is the most important part of solving. From beginner level to pro level, F2L is usually a step with the most room for improvement, requires recognizing and tracking multiple pieces at once, while there is quite a lot of freedom. Intuitive F2L Recommended: Any level Make sure you are intuitively intuitive In other words, you know how F2L works logically. In theory, there are so many unique F2L cases that memorizing them all will be a very slow way to learn it. Once you understand the intuitive concepts of this lesson, you need to practice it until it feels a little natural before moving on. Advanced F2L Recommended for: Sub-30 Basic Intuitive F2L has many steps, and some of these steps can be combined. For example, you can move the pieces to the top and pair them at the same time! Traditionally, watching the grid to solve was the best way to learn advanced F2L. But in this video, advanced concepts are structured to be easy to learn. Short versions are still useful, as you can learn good habits and situational tricks. Look ahead Recommended for: Sub-20 Until it improves, looking ahead will quickly become the most important concept in all speedsolving. Looking ahead means tracking pieces as they move to quickly predict what to do next. Using a person's reaction time to recognize each individual case is quite slow, but professionals never seem to stop and look. It's all because of a good look ahead, which is the biggest difference between slower and faster cubes. The reason we're not working on looking ahead at an earlier stage is that the brain can't focus on a lot of things very well when it goes fast. After F2L cases become like muscle memory, then you can put your focus into what to decide next. The extended F2L playlist has several videos about the techniques going forward. F2L optimization Recommended for: Sub-15 You do not need to learn 77 algorithms. As far as possible, rotations of cubes and additional moves should be avoided. While intuitive F2L takes you most of the way there, that's not always enough. With this video and f2L algorithm document, you can check out all the solutions for the best. I do not recommend learning directly from this document without having a solid grip on your own F2L solutions, which is why I recommend you to be at least under-15 before trying to optimize your F2L. Predicting the first pair recommended for: Sub-15 This is one of the most overlooked foundations of advanced CFOP. By predicting the first pair of F2L when checking, you reduce the pause after completing the cross. Moreover, the more difficult part of solving begins with less unresolved pieces and with more time to keep track of your next F2L pair. This is one of the most difficult skills to master (the competition check time is 15 seconds), but it is also the most rewarding skill for reducing time at a high level. The following steps recommended for: Under 12 I strongly recommend watching at least one part of the Advanced F2L playlist to get a lot of tricks and ideas to apply. This includes: Where to look during bad cases Several options for each case depending on the situation Practice techniques How to predict / recognize cases faster No matter what level you are at, improving F2L should be at the top of the list of priorities! List!

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