

Tetris - Basic Implementation Practice for Android

deepwaterooo

May 12, 2016

Contents

1	Upgrading versions, pretty good	1
1.1	3d tetris	1
1.1.1	Game Requirement	1
1.1.2	Status Update	2
1.2	folders	4
2	References	4
2.1	youtube designs	4
2.2	gestures	4
2.3	Activity.runOnUiThread()	5
2.4	3D design	5
2.5	GLSurfaceView	6
2.6	eventQueue vs SurfaceView threads	7
2.7	SurfaceView	7
2.8	gestures	7

1 Upgrading versions, pretty good

1.1 3d tetris

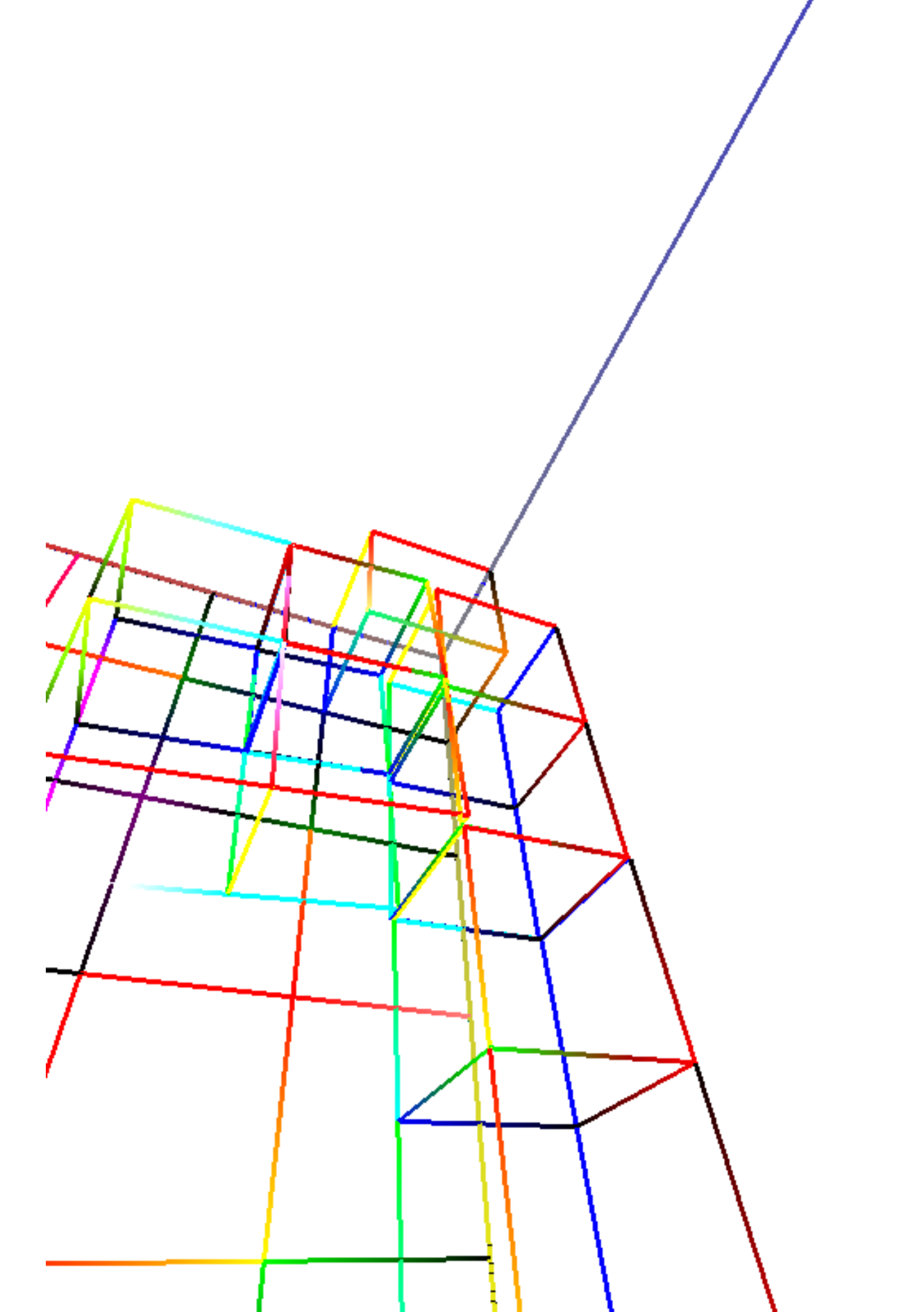
1.1.1 Game Requirement

- Layout: the main activity game view allow NO buttons; If there are too many gestures applied, could include a instruction view for gesture guide. Could have slightly interesting layout for scores, or any effects that I could come up with later on (so far has not worried or do any research about this part yet).
- Threads/Runnable: App developped in this age without threads applied I would feel shamed to call it a mobile app. Assign tasks to different runnables and manage them so that the game needs to be fast, comfortable, easy and enjoyable to play and have fun playing it. 3d game permits No slower than 2d SurfaceView double thread version.
- Gestures: includes MotionEvent for single finger, double or three fingers, use pointers, pack different gestures tasks into different runnables. gestures should be easy to use and apply. Look back on DrawingFun fun app developped during Fall 2014, fragments, threads, view/invalidates were all so easy, don't Understand why during those days I could only make them work without really/deeply understood how they works that way.
- So far the only part that I want more research is on (Frame + Grid) vs current active block rotations, so that I could rotate them according when needed, (do I really need to use ray picking for identifying them) will do more online research on this part. I could implement ray picking, just feel 2d point doesn't necessarily fall into 3d frame. (which means outside 5*5*10 gestures to rotate frame, inside 5*5*10 frame rotate current active block, but I want more research to confirm if this is the best solution).
- minors features that I could skip if I don't have time:
 - After the bridgeing Cube app, texture is not any problems for me (just need to figure out a simple easier way to build an App manager (or simpler shaders) of my own, and manager the resources). Would borrow textures (with sounds) materials from glar3d and apply textures on my 3d game after majority functionalities are finished.

- Come back to Cube app to make the mediaplayer for video work first, and then apply technic on MediaPlayer back to 3d for sounds besides the background sound, if I feel I have such a need with plants && zombies Unity game waiting for me.
- Expect the 3d game (videoable version) to be uploaded onto youtube by 5/17/2016. Considering debugging time and all other minor difficulties that I might meet later on, I will have to work hard on this one.

1.1.2 Status Update

- Has not write any line of code today yet cause I can clearly feel that I am so headache today. Went to campus at 4pm left at aront 5:30pm. Has not been on road so long and just realized it too me quite some time for the local driving during traffic hours. Arrived home around 6:30, cooked, ate, and dishing till almost 8pm. Expect to fall asleep between 12 and 1am, expect tomorrow to have a clear mind and be productive to solve the rest technical problems.
- Did some online surfing on gesture detections, set the game Requirements for this simple version opengl 3d tetris. It has been too long that I have been working on this tetris project, and I look forward to moving into Unity so that I could better apply my problems solving talents (as well as programmign skills) on bigger (3d) projects/games. I set the game requirement here, I do all the researches to meet my initial Requirements, and when I made it, I may spend some hours to learn the other interested design/implementation from glar pseudo-3d tetris game, and I may simply skip the glar3d and dive into plants && Zombies Unity game directly (if I did meet all the requirements and ideas that I have in mind and listed out today).
- Did about two hours online surfing on gestures (consolidated previous knowledges on fragments, compatible with different screen sizes, different android system versions, layout, Threads/Runnable handler communications among threads, intent etc which I did have minor bugs here or there before), will work on code side for two to three hours today, will commit once more at 11:17pm or 12:17pm depends on when I would feel tired, and try to fall asleep early today to adjust my clear mind back.
-
- need to set eye position better so that the (Frame + Grid) layout can be at the position that I want for the 3d game.
- I want yellow grids, together with white background, red-x yellow-y, but I fail get such effect. Currently using black grid, but I will change it to be better looking.
- Better organized files for OOP Practice.
- Will update either 12:17pm, 6:17pm or 12:17am daily or both or three times (or hours earlier or later), depends on progress made within time slice.
- Emacs is such a powerful tool for me for coding considering and accepting the facts that occasional it would produce some minor troubles for me so that I would have to google for solutions. This morning the parenthesis don't autopair for `() [] {}` for java-mode, after having googled for few minutes, I have used and trust autopair for so long and realized actually sometimes he gets tired, and once I close and restart it, he works perfectly. I am looking forward to the day that my beloved cousin would be able to help and guide me with emacs debugging.
- I had NOT have any design experience nor confidence for game/larger project design, but since tetris 2d which was based on an incomplete design of a undergraduate student thesis when I successful redesign and implemented it, I think now I am in the process of thinking and building my own design (as well as confidence if I could succeed this time) now. Step by step, I could make this simple 3d completely out of my own ideas.
- 3d tetris layout structure:



- a video for this Tetris game can be directly watched at <https://www.youtube.com/watch?v=Ht4N0rEUtFk>
- A video for the previous DrawingFun Android App can be watched at <https://www.youtube.com/watch?v=YV78Tk>, or by searching deepwaterooo Wang.

1.2 folders

- lame2d: the very first version of the game.
- 2d: SurfaceView rednering 2d Implementation.
- 3d: will work on a simple opengl 3d version first. Currently working on this one, will spend a few of following days on this one as well.
- glar3d: upgraded opengl 3d version adapted from tetrisglar app with textures and music, and real 3d instead of any pseudo one, will implement this one when simple 3d version is done. (After having understood texture and lights better, tried to debug this one for a while, but still complicated design and layout still make this one to some extend difficult for me for now.)

2 References

2.1 youtube designs

- shader: http://blog.csdn.net/tom_221x/article/details/38458021
- 旋转三角形 <http://www.hanshuliang.com/?post=6>
- fancy effect: <http://m.oschina.net/blog/147033>
- <http://www.cnblogs.com/liangliangh/p/4089582.html>
- texture http://learnopengl.com/code_viewer.php?code=getting-started/coordinate_systems&type=f
- github gestures explain details: <http://code.almeros.com/android-multitouch-gesture-detectors#.VzTg>

2.2 gestures

- 过程<https://wizardforcel.gitbooks.io/w3school-android/content/62.html>
- analyze with code <https://github.com/CharonChui/AndroidNote/blob/master/Android%E5%8A%A0%E5%BC%BA/Android%20Touch%E4%BA%8B%E4%BB%B6%E5%88%86%E5%8F%91%E8%AF%A6%E8%A7%A3.md>
- android MotionEvent 详解 pointers <http://www.jianshu.com/p/0c863bbde8eb>
- 图片过程详解<http://ztelur.github.io/2016/02/04/%E5%9B%BE%E8%A7%A3Android%E4%BA%8B%E4%BB%B6%E4%BC%A0%E9%80%92%E4%B9%8BView%E7%AF%87/> check github scrollview
- <http://www.jianshu.com/p/293d0c2f56cb> Android 绘制过程详解
- Track Velocity <http://developer.android.com/intl/zh-cn/training/gestures/movement.html#velocity>
- sample codes: <https://gitlab.com/tgzzi/android-training-course-in-chinese/blob/0727674297209binput/gestures/detector.md>
- Drag and Drop <http://developer.android.com/intl/zh-cn/guide/topics/ui/drag-drop.html>
- 拖拽与缩放 <http://hukai.me/android-training-course-in-chinese/input/gestures/scale.html> 更加复杂的缩放示例
- 滚动手势动画 <http://hukai.me/android-training-course-in-chinese/input/gestures/scroll.html>
- 响应触摸事件 <http://hukai.me/android-training-course-in-chinese/graphics/opengl/touch.html>
- 多线程操作 <http://hukai.me/android-training-course-in-chinese/performance/multi-threads/index.html>

- Android 入门基础 <http://hukai.me/android-training-course-in-chinese/basics/index.html>
- example code Android 中实现图片平移、缩放、旋转同步进行 <http://android.jobbole.com/82072/>
-
-

2.3 Activity.runOnUiThread()

- <http://stackoverflow.com/introduction-to-Message-Handler-in-Android/>
- <http://m.oschina.net/blog/97619>
- AssetManager: <http://m.jb51.net/article/57341.htm>
- A 3d reference: <https://github.com/kdomic/android-3d-tetris>

2.4 3D design

- c++ version: <https://github.com/matachi/tetris-cpp>
- refer 6 http://www.oschina.net/question/614942_62370
- http://www.oschina.net/question/565065_67280
- triangle: <http://stackoverflow.com/questions/9945321/triangle-opengl-in-android>
- <https://gist.github.com/SebastianJay/3316001>
- 射线拾取: <http://itdocument.com/479827008/>
- 旋转及手势: <http://vaero.blog.51cto.com/4350852/790620>
- 2 <http://vaero.blog.51cto.com/4350852/790637>
- <http://www.lai18.com/content/951343.html>
- opengl 选择与反馈: <http://zhidao.baidu.com/question/496046750245095004.html>
- <http://wenku.baidu.com/view/58190d1efad6195f312ba6f7.html>
- c++ <http://blog.csdn.net/u010223072/article/details/45369075>
- <http://codercdy.com/2015/06/17/openglxue-xi-bi-ji-xuan-ze-he-fan-kui/>
- https://books.google.com/books?id=u6EHM_0zaFQC&pg=PA1987&lpg=PA1987&dq=opengl%E9%80%89%E6%8A9%E4%B8%8E%E5%8F%8D%E9%A6%88&source=bl&ots=L9Y66QSEhu&sig=f1h_RadXRDFsa9L5IY430HGTG34&hl=es&sa=X&ved=0ahUKEWjA6vTRo_jLAhVH3mMKHQIXBxYQ6AEIPDAE#v=onepage&q=opengl%E9%80%89%E6%8B%A9%E4%B8%8E%E5%8F%8D%E9%A6%88&f=false
- c++ codes: <http://dev.gameres.com/program/Visual/3D/Selection.htm>
- 画线: c++ <http://www.programgo.com/article/43724048060/>
- draw line: <http://www.linuxidc.com/Linux/2011-09/42307p3.htm>
- <http://stackoverflow.com/questions/9217702/open-gl-es-2-0-drawing-a-simple-line>
- 矩阵变换: <http://www.cnblogs.com/caster99/p/4780984.html>
- <http://www.flakor.cn/2014-05-15-384.html>
- shader util: <http://blog.csdn.net/shulianghan/article/details/17020359>
- 详解矩阵变换: http://www.cnblogs.com/kesalin/archive/2012/12/06/3D_math.html
- <http://mail.cfanz.cn/index.php?c=article&a=read&id=270244>
- one example: <http://www.apkbus.com/blog-99192-39498.html>

- ex2 for shader matrix: http://www.voidcn.com/blog/peanut__love/article/p-2891341.html
- 西蒙 iPhone-OpenGL ES 中文教程专题: <http://www.cocoachina.com/special/2010/0126/404.html>
- 运动: <http://www.cocoachina.com/bbs/read.php?tid-7601-fpage-10.html>
- 矩阵: <http://blog.csdn.net/wangdingqiaoit/article/details/39010077>
- <http://blog.csdn.net/popy007/article/details/5120158> UNV
- <http://www.tqcto.com/article/mobile/23873.html> eye
- <http://blog.csdn.net/wangdingqiaoit/article/details/39937019>
- https://developer.apple.com/library/ios/documentation/3DDrawing/Conceptual/OpenGL_ES_Program_Introduction/Introduction.html
- <http://blog.csdn.net/shulianghan/article/details/46680803>
- rotation: <http://stackoverflow.com/questions/13480043/opengl-es-android-matrix-transformation>
- glsl example: <http://cse.csusb.edu/tongyu/courses/cs520/notes/android-es2.php>
- shader parser: <http://stackoverflow.com/questions/19452240/opengl-glsl-void-parse-error-on-ver>
- separate file: <http://stackoverflow.com/questions/30345816/splitting-a-text-file-into-multiple->

2.5 GLSurfaceView

- opengl: <http://androidblog.reindustries.com/a-real-open-gl-es-2-0-2d-tutorial-part-1/>
- Graphics architecture: <https://source.android.com/devices/graphics/architecture.html>
- <http://stackoverflow.com/questions/5169338/android-deciding-between-surfaceview-and-opengl>
- 引路蜂 better: <http://blog.csdn.net/mapdigit/article/details/7526556>
- 真正的 3D 图形: <http://www.imobilebbs.com/wordpress/archives/1554>
- a Cube: http://www.oschina.net/question/4873_28325
- modification: <https://github.com/googleglass/gdk-apidemo-sample/blob/master/app/src/main/java/com/google/android/glass/sample/apidemo/opengl/Cube.java>
- Android OpenGL ES 简明开发教程小结: <http://www.imobilebbs.com/wordpress/archives/1583>
- <http://hellosure.github.io/android/2015/06/01/android-glsurfaceview/>
- <http://ju.outofmemory.cn/entry/172850>
- 画图: <http://www.mobile-open.com/2015/81568.html>
- <http://tangzm.com/blog/?p=20>
- <http://www.apkbus.com/blog-99192-39584.html>
- onDrawFrame intro: <http://www.jayway.com/2009/12/03/opengl-es-tutorial-for-android-part-i/>
- failed: <http://stackoverflow.com/questions/28711850/android-opengl-how-to-draw-a-rectangle>
- onTouchEvent: http://blog.csdn.net/niu_gao/article/details/8673662
- volatile <http://www.voidcn.com/blog/fanfanxiaoazu/article/p-3668133.html>
- <http://mobile.51cto.com/aengine-437172.htm>
- OpenGL ES related: <http://stackoverflow.com/questions/9945321/triangle-opengl-in-android>
- OpenGL ES 2.0 Sample Code: <http://androidbook.com/item/4254>
- intros: 详解 http://blog.csdn.net/niu_gao/article/details/7566297

- 画线: <http://www.cnblogs.com/lhxin/archive/2012/06/01/2530828.html>
- <http://bbs.9ria.com/thread-201740-1-1.html>
- <http://imgtec.eetrend.com/blog/5078>
- draw a ball http://shikezhi.com/html/2015/android_1022/561912.html
- for Board c++: <http://www.jiancool.com/article/24471349949/>
- possible? http://code1.okbase.net/codefile/CCFormatter.java_2015072733469_393.htm
- <http://www.mobile-open.com/2015/80379.html>

2.6 eventQueue vs SurfaceView threads

- Deeper summary, android graphics architecture: <http://hukai.me/android-deeper-graphics-architecture/>
- 2 threads, load, read, <http://blog.csdn.net/hellogv/article/details/5986835>

2.7 SurfaceView

- Surface runnable <http://android.okhelp.cz/surfaceview-implements-runnable-android-code/>
- Example: <http://technicalsearch.iteye.com/blog/1967616>
- <http://www.jcodecraeer.com/a/anzhuokaifa/androidkaifa/2012/1201/656.html>
- Event Queue: <http://www.leestorm.com/post/17.html>
- lockCanvas(Rect 小|区) http://blog.csdn.net/alexander_xfl/article/details/13000347
- example: <http://fanli7.net/a/JAVAbiancheng/ANT/20120424/160203.html>
- MotionEvent: <http://android.jobbole.com/82072/>
- surfaceview 双缓冲: <http://blog.csdn.net/cnblogger/article/details/7404485>
- sth worth try: <http://www.lxway.com/969295592.htm>
- Dont Understand: http://blog.sina.com.cn/s/blog_5a6f39cf01012rtv.html
- tried: <http://bbs.csdn.net/topics/370074255> drawBitmap 2 canvas
- slightly complicated: <http://www.lxway.com/148606691.htm>
- slightly complicated: <http://www.lxway.com/186948856.htm>

2.8 gestures

- <http://www.cnblogs.com/akira90/archive/2013/03/10/2952886.html>
- Android 触摸手势基础官方文档概览: <http://www.lxway.com/445554926.htm>
- 手势: <http://wiki.jikexueyuan.com/project/material-design/patterns/gestures.html>
- <http://www.lxway.com/601620614.htm>
- <http://www.lxway.com/282219004.htm>
- <http://www.lxway.com/906451412.htm>
- <http://www.lxway.com/146619692.htm>
- <http://www.lxway.com/4420294641.htm>
- <http://www.lxway.com/155059816.htm>
- <http://www.lxway.com/4019928952.htm>

- 例子: <http://bbs.chinaunix.net/thread-3634477-1-1.html>
- 例子: <http://www.bestappsmarket.com/p/app?appId=1192877&title=tetris-%E4%BF%84%E7%BD%97%E6%96%AF%E6%96%B9%E5%9D%97>
- 例子: <http://bbs.chinaunix.net/thread-3634477-1-1.html>
- iTetris: <http://searchapp.soft4fun.net/article/information/iTetris%20%E4%BF%84%E7%BD%97%E6%96%AF%E6%96%B9%E5%9D%97/313319>
- left right: <http://www.jb51.net/article/77028.htm>
- AI: <http://www.cnblogs.com/youngshall/archive/2009/03/24/1420682.html>
- 3/11/2016 Friday
- <https://github.com/Almeros/android-gesture-detectors> mac
- <http://www.jcodecraeer.com/a/anzhuokaifa/androidkaifa/2015/0211/2467.html>
- <http://www.hejun.biz/81.html>
- <http://www.jb51.net/article/38166.htm>
- <http://www.jb51.net/article/37717.htm>
- <http://mobile.51cto.com/aprogram-394841.htm>
- TetrisBattle 特殊轉入教學 (Z S J L I)
 - https://www.youtube.com/watch?v=zW6Gp_7jl9I
- 推箱子: 第 11 章 Android 游戏开发视频教程益智游戏——推箱子
 - <https://www.youtube.com/watch?v=glzxII1-P0A> 2.5D
- 祖码游戏的设计与实现