



先进编译实验室  
Advanced Compiler

先进编译实验室  
Advanced Compiler

# Triton源码结构

先进编译实验室  
Advanced Compiler

嘉宾：刘灿



先进编译实验室  
Advanced Compiler



<https://github.com/triton-lang>

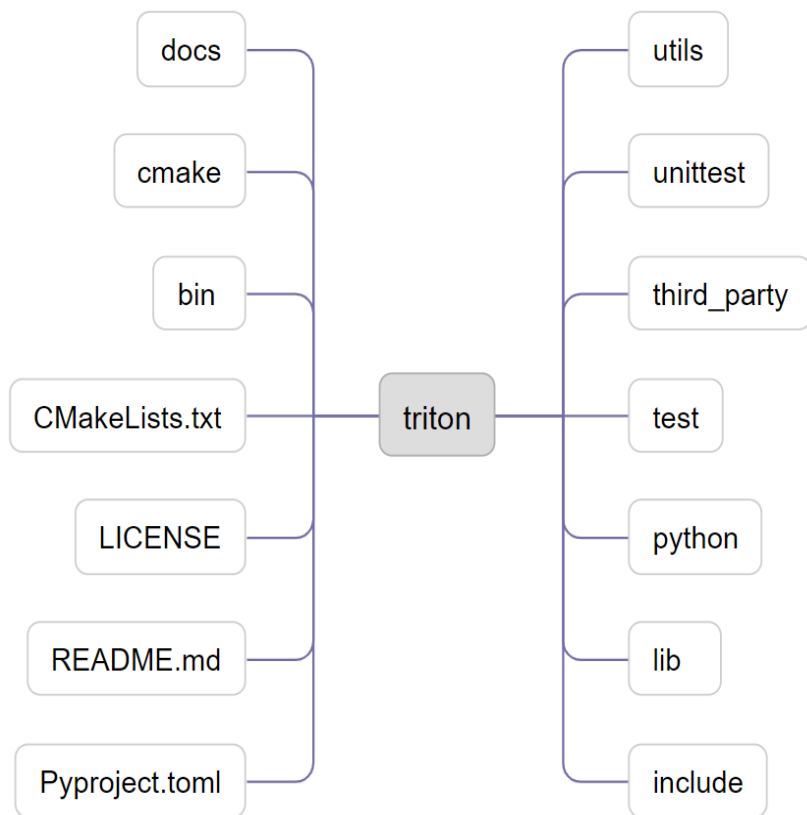
# 一级目录

2



先进编译实验室  
Advanced Compiler

<https://github.com/tutor-lang/triton>



• docs/:项目文档目录

• cmake/:构建配置相关目录

• bin/:实用工具、脚本目录

• CmakeLists.txt:CMake 的配置文件

• LICENSE:项目许可证文件

• README.md:项目介绍和使用说明

• Pyproject.toml: python 项目配置文件

• utils/:项目配置文件目录

• unittest/:单元测试代码目录

• third\_party/:第三方资源目录

• test/:测试代码目录

• python/:python 接口代码目录

• lib/:核心逻辑实现目录

• include/:核心逻辑定义目录



先进编译实验室  
Advanced Compiler



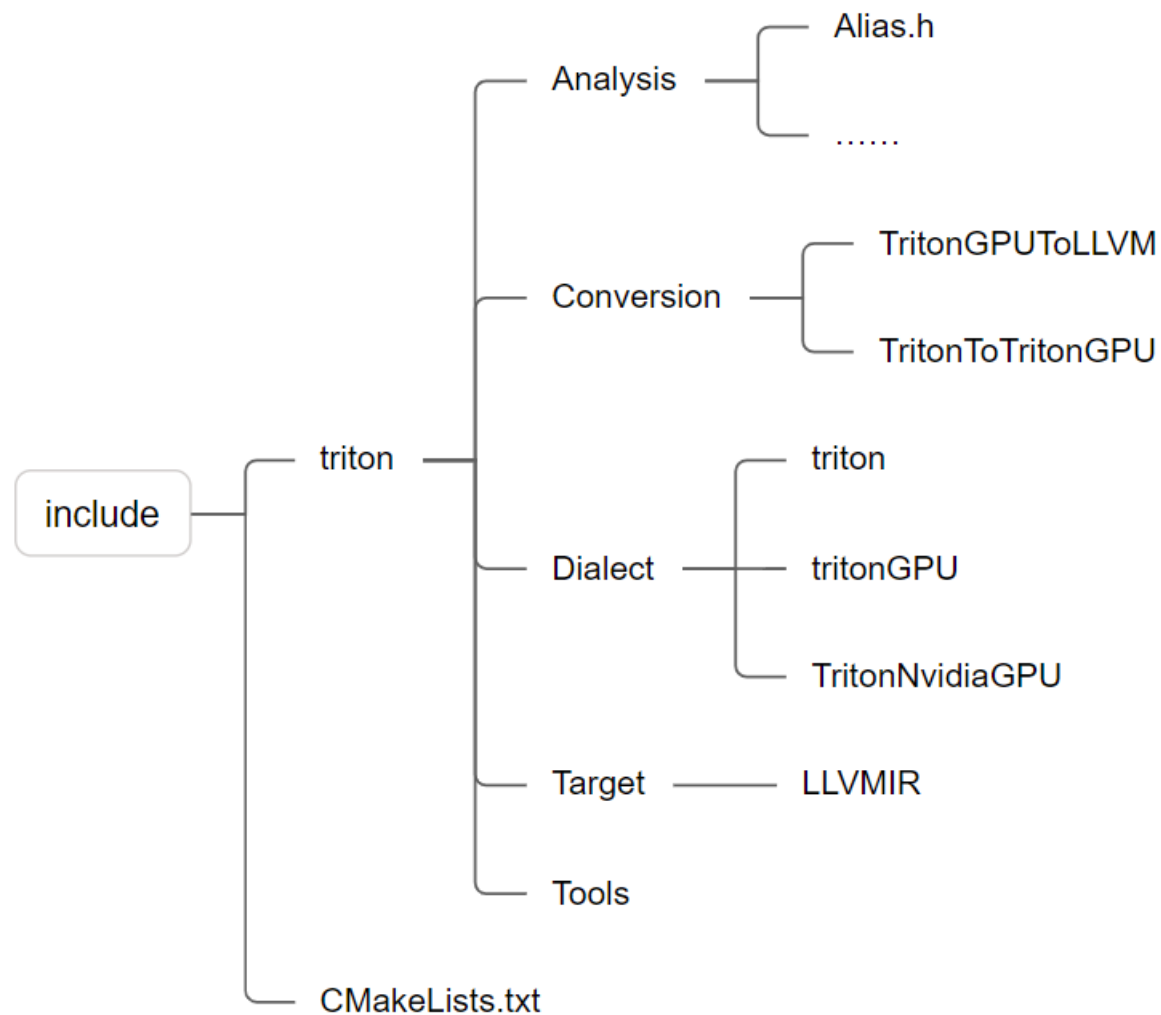
# include & lib目录

3

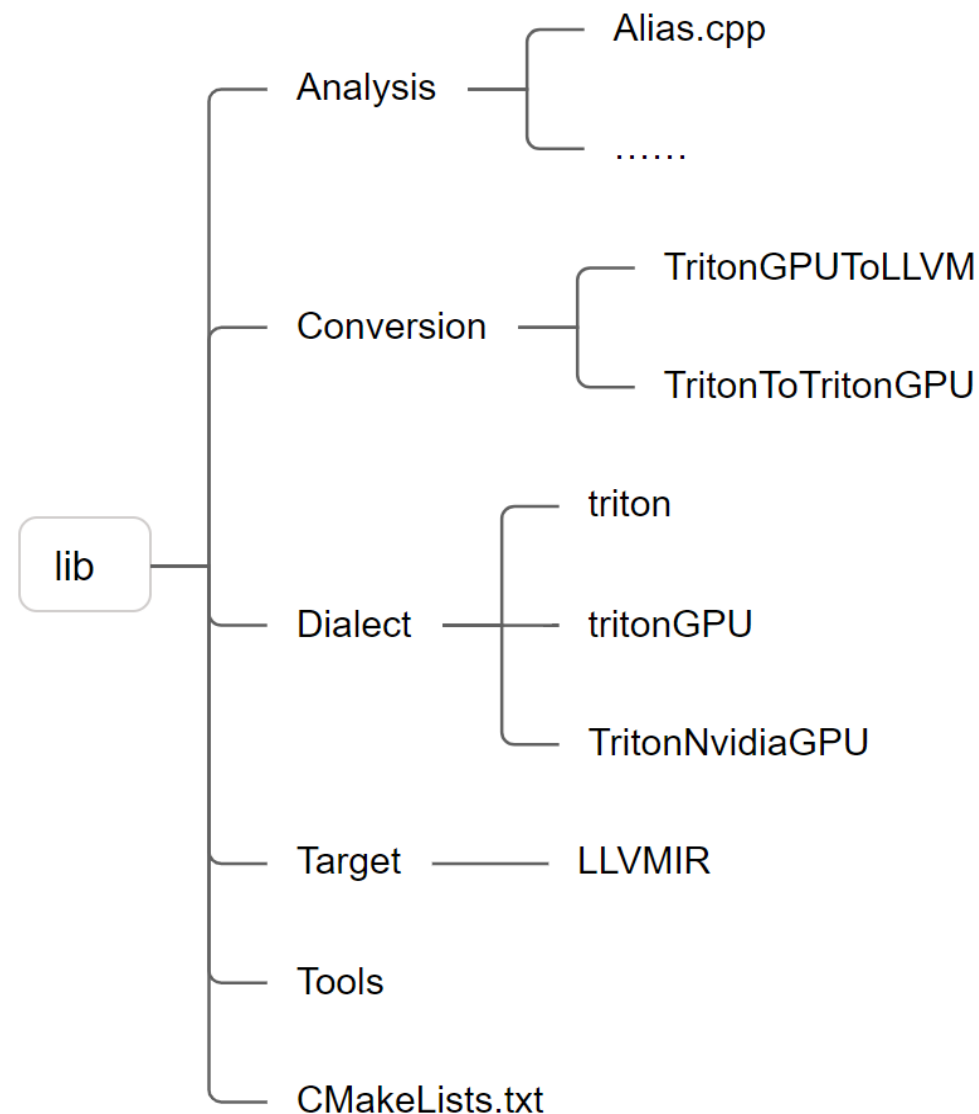


先进编译实验室  
Advanced Compiler

<https://github.com/tutor-lang/triton>



先进编译实验室  
Advanced Compiler



# include & lib目录文件



先进编译实验室  
Advanced Compiler

<https://github.com/triton-lang/triton>

4

```

  include
  include triton
    Analysis
      Alias.h
      Allocation.h
      AxisInfo.h
      Membar.h
      Utility.h
    Conversion
      TritonGPUToLLVM
      TritonToTritonGPU
      CMakeLists.txt
      MLIRTypes.h
    Dialect
      Triton
      TritonGPU
      TritonNvidiaGPU
      CMakeLists.txt
    Target
      LLVMIR
      CMakeLists.txt
    Tools
      CMakeLists.txt
      CMakeLists.txt
```

Advanced Compiler

```

  lib
  lib Analysis
    Alias.cpp
    Allocation.cpp
    AxisInfo.cpp
    CMakeLists.txt
    Membar.cpp
    Utility.cpp
  lib Conversion
    TritonGPUToLLVM
    TritonToTritonGPU
    CMakeLists.txt
  lib Dialect
    Triton
    TritonGPU
    TritonNvidiaGPU
    CMakeLists.txt
  lib Target
    LLVMIR
    CMakeLists.txt
  lib Tools
    CMakeLists.txt
```



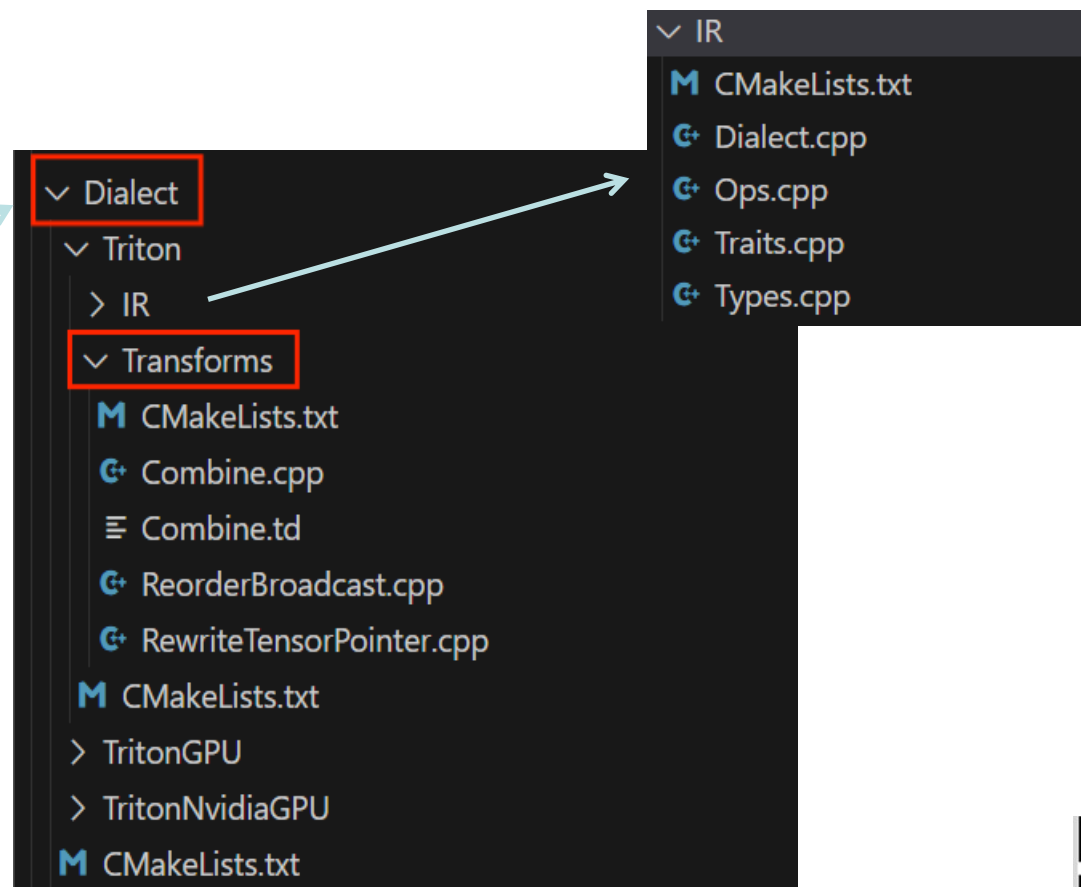
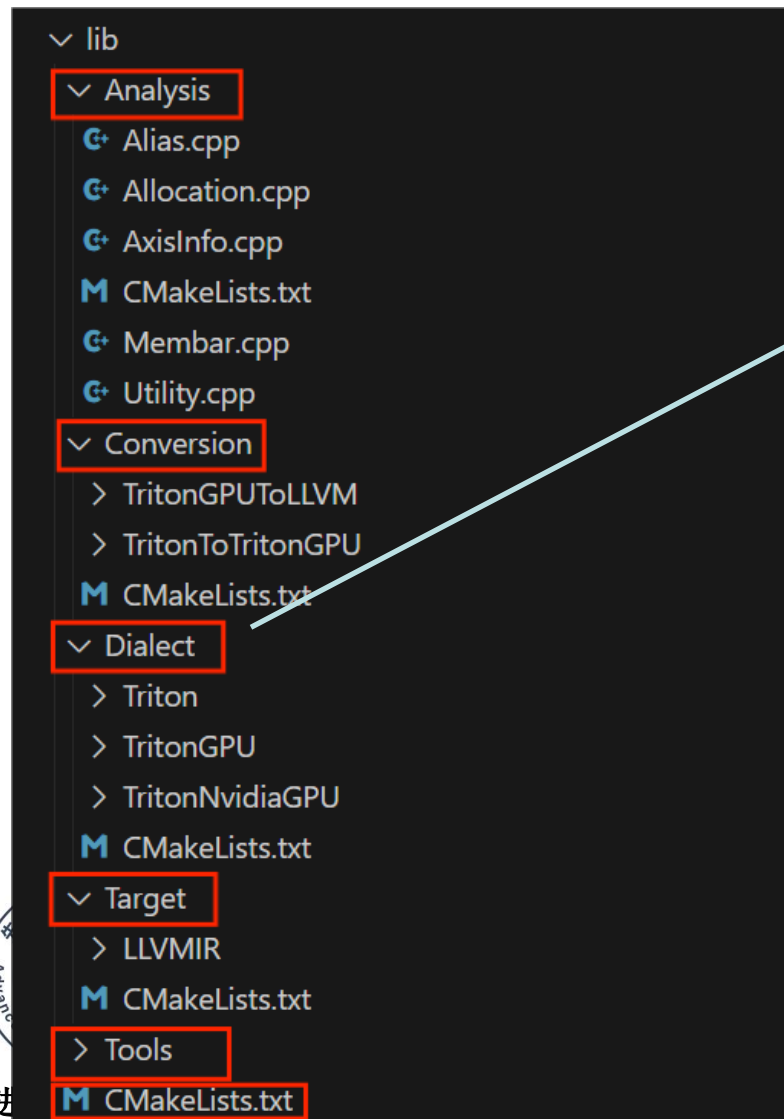
# Dialect目录

5



先进编译实验室  
Advanced Compiler

<https://github.com/triton-lang/triton>



# 编译流程对应源码位置

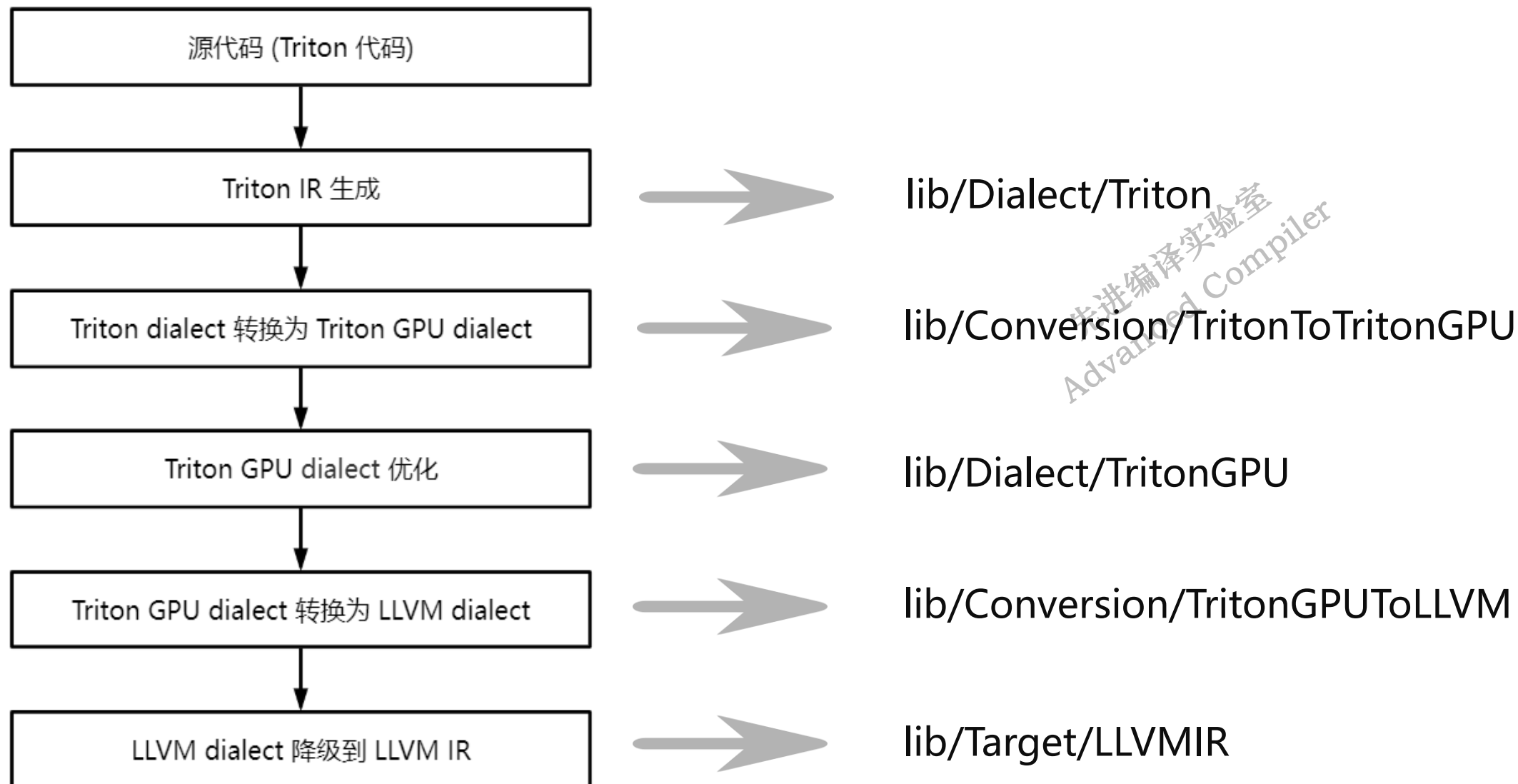
6



先进编译实验室

Advanced Compiler

<https://github.com/tutor-lang/triton>



## Triton Dialect

Op定义: `/include/triton/Dialect/Triton/IR/TritonOps.td`

`tt.call`、`tt.func`、`tt.return`、`tt.load`、`tt.store`、`tt.dot`等Op

优化Pass: `/lib/Dialect/Triton/Transforms`

`CombineOpsPass`、`ReorderBroadcastPass`、`RewriteTensorPointerPass`、`LoopUnrollPass`

## Triton Dialect → TritonGPU Dialect

转换Pass: `lib/Conversion/TritonToTritonGPU/TritonToTritonGPUPass.cpp`





## TritonGPU Dialect

Op定义: `/include/triton/Dialect/TritonGPU/IR/TritonGPUOps.td`

`async_wait`、`alloc_tensor`、`insert_slice_async`、`convert_Layout`等Op

Layout属性定义: `/include/triton/Dialect/TritonGPU/IR/TritonGPUAttrDefs.td`

`Blocked Layout`、`MMA Layout`、`DotOperand Layout`、`Slice Layout`、`Shared Layout`

优化Pass: `/lib/Dialect/TritonGPU/Transforms`

`AccelerateMatmul`、`Coalesce`、`CombineTensorSelectAndIf`、`OptimizeAccumulatorInit`

、`OptimizeDotOperands`、`OptimizeThreadLocality`、`Pipeline`、`Prefetch`、`ReduceDataDuplica`

`tion`、`RemoveLayoutConversions`、`ReorderInstructions`、`AllocateSharedMemoryPass`







源码链接: <https://github.com/triton-lang/triton>

先进编译实验室  
Advanced Compiler

先进编译实验室  
Advanced Compiler





AdvancedCompiler

Tel: 13839830713