

Scatter 层[TODO]

- 初始示例代码
- axis
- mode

初始示例代码

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import numpy as np
from cuda import cudart
import tensorrt as trt

np.random.seed(97)
nIn, cIn, hIn, wIn = 1, 3, 4, 5 # 输入张量 NCHW
data0 = np.arange(nIn * cIn * hIn * wIn, dtype=np.float32).reshape(nIn, cIn, hIn, wIn) # 输入数据
#data1 = np.random.randint(0,4,[nIn,cIn,hIn,wIn])
data1 = np.tile(np.arange(wIn), [nIn, cIn, hIn, 1]).astype(np.float32).reshape(nIn, cIn, hIn, wIn)
data2 = -data0

np.set_printoptions(precision=8, linewidth=200, suppress=True)
cudart.cudaDeviceSynchronize()

logger = trt.Logger(trt.Logger.ERROR)
builder = trt.Builder(logger)
network = builder.create_network(1 << int(trt.NetworkDefinitionCreationFlag.EXPLICIT_BATCH))
config = builder.create_builder_config()
config.max_workspace_size = 1 << 30
inputT0 = network.add_input('inputT0', trt.DataType.FLOAT, (nIn, cIn, hIn, wIn))
inputT1 = network.add_input('inputT1', trt.DataType.INT32, (nIn, cIn, hIn, wIn))
inputT2 = network.add_input('inputT2', trt.DataType.FLOAT, (nIn, cIn, hIn, wIn))
#-----# 替换部分
scatterLayer = network.add_scatter(inputT0, inputT1, inputT2, trt.ScatterMode.ELEMENT)
scatterLayer.axis = 3
#-----# 替换部分
network.mark_output(scatterLayer.get_output(0))
engineString = builder.build_serialized_network(network, config)
engine = trt.Runtime(logger).deserialize_cuda_engine(engineString)
context = engine.create_execution_context()
_, stream = cudart.cudaStreamCreate()

inputH0 = np.ascontiguousarray(data0.reshape(-1))
inputH1 = np.ascontiguousarray(data1.reshape(-1))
inputH2 = np.ascontiguousarray(data2.reshape(-1))
outputH0 = np.empty(context.get_binding_shape(3), dtype=trt.nptype(engine.get_binding_dtype(3)))
_, inputD0 = cudart.cudaMallocAsync(inputH0.nbytes, stream)
_, inputD1 = cudart.cudaMallocAsync(inputH1.nbytes, stream)
_, inputD2 = cudart.cudaMallocAsync(inputH2.nbytes, stream)
_, outputD0 = cudart.cudaMallocAsync(outputH0.nbytes, stream)

cudart.cudaMemcpyAsync(inputD0, inputH0.ctypes.data, inputH0.nbytes,
cudart.cudaMemcpyKind.cudaMemcpyHostToDevice, stream)
cudart.cudaMemcpyAsync(inputD1, inputH1.ctypes.data, inputH1.nbytes,
cudart.cudaMemcpyKind.cudaMemcpyHostToDevice, stream)
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cudart.cudaMemcpyAsync(inputD2, inputH2.ctypes.data, inputH2.nbytes,
cudart.cudaMemcpyKind.cudaMemcpyHostToDevice, stream)
context.execute_async_v2([int(inputD0), int(inputD1), int(inputD2), int(outputD0)], stream)
cudart.cudaMemcpyAsync(outputH0.ctypes.data, outputD0, outputH0.nbytes,
cudart.cudaMemcpyKind.cudaMemcpyDeviceToHost, stream)
cudart.cudaStreamSynchronize(stream)


print("inputH0 :", data0.shape)
print(data0)
print("inputH1 :", data1.shape)
print(data1)
print("inputH2 :", data2.shape)
print(data2)
print("outputH0:", outputH0.shape)
print(outputH0)


cudart.cudaStreamDestroy(stream)
cudart.cudaFree(inputD0)
cudart.cudaFree(outputD0)

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