> $batchsize := 90$:
  $num\_steps := \text{trunc}\left(\dfrac{32000}{batchsize} \right)$:
  $baseSizeX := 28$:
  $baseSizeY := 28$:
  $infaltionFactor := 3$:
  $imageSizeX := ((baseSizeX - 1) * infaltionFactor) + 1$:
  $imageSizeY := ((baseSizeY - 1) * infaltionFactor) + 1$:
  $num\_filters := 8$:
  $conv\_size1 := 3$:
  $conv\_size2 := 3$:
  $imageSizeX\_afterConvolution := imageSizeX - conv\_size1 + 1$:
  $imageSizeY\_afterConvolution := imageSizeY - conv\_size1 + 1$:
  $pool\_layers\_window := 2$:
  $pool\_layers\_stride := 2$:
  $imageSizeX\_afterPooling := (imageSizeX\_afterConvolution - pool\_layers\_window)$
    $/ pool\_layers\_stride + 1$:
  $imageSizeY\_afterPooling := (imageSizeY\_afterConvolution - pool\_layers\_window)$
    $/ pool\_layers\_stride + 1$:
  $num\_classes := 10$:
  $num\_finalImages := num\_filters$:
  $num\_lastLayer\_inputNeurons := num\_finalImages * imageSizeX\_afterPooling$
    $* imageSizeY\_afterPooling$:
  $threads := 18$:

> $fcl\_cleanup := threads \cdot num\_classes \cdot (num\_lastLayer\_inputNeurons + 1)$
$$fcl\_cleanup := 2304180$$ **(1)**

> $conv\_cleanup := threads \cdot num\_filters \cdot (conv\_size1 \cdot conv\_size2 + 1)$
$$conv\_cleanup := 1440$$ **(2)**

> $update := num\_classes \cdot (num\_lastLayer\_inputNeurons \cdot (threads + 3) + threads + 3)$
    $+ num\_filters \cdot (conv\_size1 \cdot conv\_size2 \cdot (threads + 3) + threads + 3)$
$$update := 2689890$$ **(3)**

> $conv\_backprop := num\_filters \cdot imageSizeX\_afterConvolution \cdot imageSizeY\_afterConvolution$
    $\cdot (conv\_size1 \cdot conv\_size2 \cdot 3 + 2)$

$$conv\_backprop := 1484800$$ **(4)**

> $ReLuPrime := num\_filters \cdot imageSizeX\_afterConvolution \cdot imageSizeY\_afterConvolution \cdot 2$
$$ReLuPrime := 102400$$ **(5)**

> $pool\_backprop := num\_filters \cdot imageSizeX\_afterPooling \cdot imageSizeY\_afterPooling \cdot 9$
$$pool\_backprop := 115200$$ **(6)**

> $fcl\_backprop := num\_filters \cdot imageSizeX\_afterPooling \cdot imageSizeY\_afterPooling \cdot (1$
    $+ num\_classes \cdot 6)$
$$fcl\_backprop := 780800$$ **(7)**

> $softmax := num\_classes \cdot 5$
$$softmax := 50$$ **(8)**

> $fcl\_forward := num\_classes \cdot (2 + num\_filters \cdot imageSizeX\_afterPooling$

$$\cdot\ imageSizeY\_afterPooling\cdot 3\ )$$

$$fcl\_forward := 384020 \tag{9}$$

> $pool\_forward := num\_filters\cdot\ imageSizeX\_afterPooling\cdot\ imageSizeY\_afterPooling$
> $\cdot\left(pool\_layers\_window^2 + 4\right)$

$$pool\_forward := 102400 \tag{10}$$

> $ReLu := num\_filters\cdot imageSizeX\_afterConvolution\cdot imageSizeY\_afterConvolution$

$$ReLu := 51200 \tag{11}$$

> $conv\_forward := num\_filters\cdot\ imageSizeX\_afterConvolution \cdot\ imageSizeY\_afterConvolution \cdot (2$
> $+\ conv\_size1\cdot conv\_size2\cdot 3\ )$

$$conv\_forward := 1484800 \tag{12}$$

> $forward := conv\_forward + ReLu + pool\_forward + fcl\_forward + softmax + fcl\_backprop$
> $+\ pool\_backprop + ReLuPrime + conv\_forward$

$$4.51 \times 10^6 \tag{13}$$

> $learn := batchsize\cdot forward + update + conv\_cleanup + fcl\_cleanup$

$$4.11 \times 10^8 \tag{14}$$

> $train := num\_steps\cdot learn$

$$1.46 \times 10^{11} \tag{15}$$

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