



# Problem and Users

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Sddec24-13



# Project Overview

## ReRam Crossbar ASIC Fabrication

- Utilize memristors to develop a crossbar matrix capable of vector matrix multiplication to perform computation
- Submit a qualifying project to Efabless using the Caravel “harness” SoC

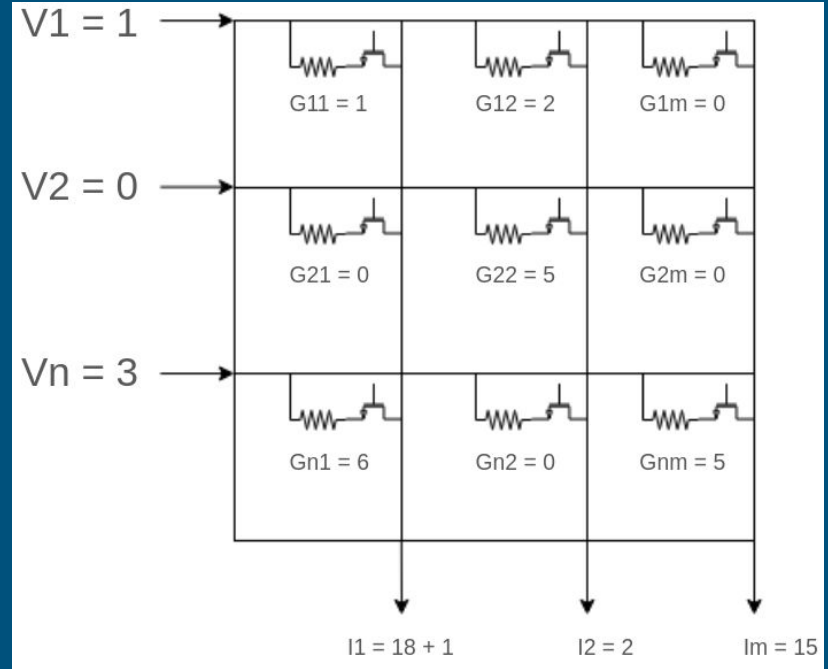


Fig 1. Example ReRam MAC

# Problem statement

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We need to use open source software to create a feasible and practical design for a test vehicle for in memory computation using ReRAM. This will involve the design and implementation of multiple smaller analog circuits.

## Crossbar ReRam applications:

- Neural Networks
- Low voltage sensors
- Few time write (FTP) NVM

## Reram benefits:

- Fast computation
- Low voltage
- Physical verticality
- Better memory retention compared to flash

# Users

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## Elton John - Research Professor

- Interested in the viability of in memory computation in non-volatile memory
- Sees ReRAM as a potential replacement for current memory types in low power systems
  - Uses in different sensor types

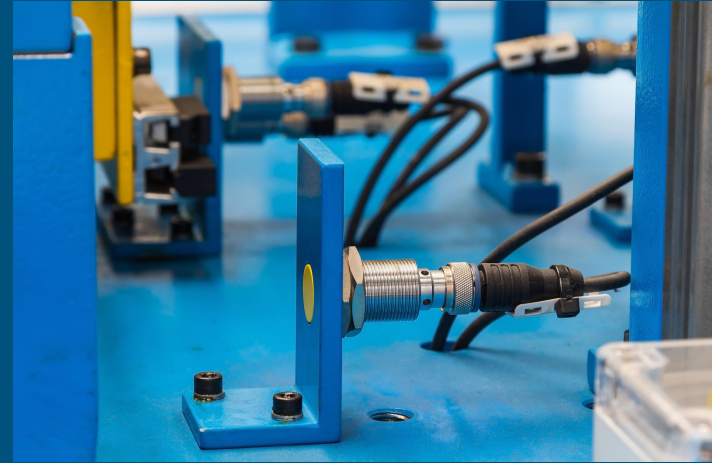


# Users

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## Michael Scott - Automotive Businessman

- Looking for a low power replacement for NAND flash
- Interested in memristor technology and it's power efficiency



# Users

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## Sudhir Patel - PHD Student

- Primarily focused on the progression of semiconductor materials and power efficient IC designs
- Looking for a publication to put on his resume
  - ReRAM is a newer technology that is being researched fervently



# Synopsis

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- Project goals:
  - Create a working sample of a ReRAM crossbar for physical testing
  - Design and submit our design for fabricate with Efabless
  
- Probable users:
  - Researchers and industry interested in ReRam computation
  - Students interested in a co-curricular chip design project