

Energy Efficiency Fast Fourier Transform Design Based on Computing-in-Memory

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Abstract—Fast Fourier Transform(FFT) is a widely used algorithm in mathematics and engineering while it costs lots of energy and storage. Computing-in-Memory(CIM) is an emerging technology which can realize computation and storage in same memory. This brief explores and analyzes the FFT design using CIM technology for energy efficiency improvement. On the basis of the multiplication-accumulation computing mode, we using mixed-radix FFT design. The analysis shows that this design can achieve high throughput while in a small energy consumption.

Index Terms—CIM, FFT, Mix-Radix, Energy Efficiency.

I. INTRODUCTION

FFT is an essential algorithm which convert signal from time domain to frequency domain. In the age of IoT, we have many ultralow-power devices such as cell phone, wireless sensor nodes and implantable biomedical devices. In the same time, FFT is a high throughput application which will costs a lot of energy in computing. There is a dilemma which is developing FFT application scenarios in ultralow-power devices while FFT need high energy consumption. However, the emerging CIM technology is a good choice to solve this problem.

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II. FFT DESIGN

III. SIMULATION RESULT

IV. CONCLUSION

REFERENCES

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