Saturating Bit Counter Simulator: An Evaluation on the Effects of Varying Bits

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**Abstract**

*Since the introduction of the Saturating Bit Counter in the 1980’s [1] there have been numerous ideas using this algorithm in branch prediction. Something that can be modified with the saturating bit counter is the number of bits. I wanted to build a simulator that could aid in deciding what amount of bits is right for projects on a more individual basis.*

*Expanding on this idea, we could possibly pair the saturating bit counter simulator’s best prediction with a compiler. That compiler could be recommended a bit size for their project specific saturating bit counter.*

1. Introduction

In life, we can prepare for many things if we have the prior knowledge. We know that a usual day would entail, History tends to repeat itself and if we have a good knowledge on the past we can better predict the future. The Saturating Bit Counter [1] has been widely used in branch prediction. One common use or this is the Tournament Predictor where there are two or more types of predictions and based on the Saturating bit counter you pick the side more heavily weighted.

2. Saturating Bit Counter

The Saturating Bit counter was introduced by James E. Smith