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by

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A USER'S GUIDE TO CLONING SYSTEMS

MATTHEW C. B. ZAREMSKY

Abstract. The author, in joint work with Stefan Witzel (to appear in Groups, Geometry, and Dynamics), developed a procedure for building new examples of groups in the extended family of Thompson groups, using what we termed *cloning systems*. These new Thompson-like groups can be thought of as limits of families of groups; however, unlike other limiting processes, e.g., direct limits, these tend to be well behaved with respect to finiteness properties. In this expository paper, we distill the crucial parts of that 50-page paper into a more digestible form for those curious to understand the construction but less curious about the gritty details. We also give some new examples involving signed symmetric groups and twisted braid groups.

1. Introduction

The notion of a *cloning system* on a family of groups $(G_n)_{n\in\mathbb{N}}$ was introduced by Stefan Witzel and the author in [11]. Given a cloning system on $(G_n)_{n\in\mathbb{N}}$, one gets a group $\mathscr{T}(G_*)$, called the *generalized Thompson group* for the cloning system (more often called a *Thompson-like group*). One original motivation for axiomatizing the cloning system construction was to build a general framework giving rise to various preexisting versions of the Thompson groups, for example, groups called F, V, V_{br}, and F_{br} (using the families $(\{1\})$, (S_n), (B_n), and (PB_n), respectively), and also some new examples the authors found, for example, using the family $(B_n(R))$. Here, $B_n(R)$ is the group of upper triangular n-by-n matrices over a ring R. Throughout this paper, we will assume the reader has some familiarity with Thompson groups; see [8] for a standard reference. (As a

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