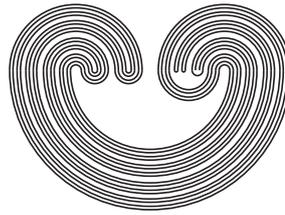


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## NEIGHT: THE NESTED WEIGHT OF A TOPOLOGICAL SPACE

by

WILLIAM R. BRIAN

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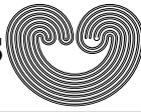
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**Mail:** Topology Proceedings  
Department of Mathematics & Statistics  
Auburn University, Alabama 36849, USA

**E-mail:** [topolog@auburn.edu](mailto:topolog@auburn.edu)

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## NEIGHT: THE NESTED WEIGHT OF A TOPOLOGICAL SPACE

WILLIAM R. BRIAN

**ABSTRACT.** The neight (nested weight) of a topological space  $X$  is the smallest number of nests in  $X$  whose union provides a subbasis for  $X$ . We explore some basic properties of this function, emphasizing the connections of neight with the small inductive dimension, weight, character, and density of a space.

### 1. DEFINITIONS AND PRELIMINARIES

Let  $X$  be a topological space. A set  $\mathcal{N}$  of subsets of  $X$  is called a **nest** if  $\mathcal{N}$  is totally ordered by  $\subseteq$ . In this paper we consider the question: *How many nests does it take to generate a given topology?*

For example, if  $X$  is a LOTS (Linearly Ordered Topological Space with the order topology) then

$$\mathcal{N}_L = \{(-\infty, a) : a \in X\} \quad \text{and} \quad \mathcal{N}_R = \{(a, \infty) : a \in X\}$$

are two nests in  $X$  and  $\mathcal{N}_L \cup \mathcal{N}_R$  provides a subbasis for  $X$ . A stronger result, given as Theorem 2.2 in [2], is that (for  $T_1$  spaces) the topology of  $X$  is generated by two nests if and only if  $X$  is a GO space (recall that a GO space, or Generalized Order space, is any space that is homeomorphic to a subspace of a LOTS).

It is trivially true that every topological space  $X$  has a subbasis that can be written as a union of nests: for each open subset  $U$  of  $X$ ,  $\{U\}$  is

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