

# Problem to Think About

Friday, September 9, 2016

Recall the *buffering property*: A regular  $n$  dimensional CW complex has this property if for every top dimensional cell  $\sigma^n$ , the set

$$A_{\sigma^n} = \bigcup_{\substack{\alpha \text{ and } \sigma \text{ share an } (n-1) \text{ dimensional face}}} \overline{\alpha^n}$$

is a closed neighbourhood of  $\sigma$ .

Note that the cell decomposition of  $\mathbb{R}^2$  by triangles, with six meeting at each vertex, does not have the buffering property, but the decomposition by hexagons (three meeting at each vertex) does.

Can you find a cell decomposition of  $\mathbb{R}^3$  with the buffering property? Can you think of one such that there is a CW complex automorphism that takes any 3 dimensional cell to any other?