Magnetic Origami

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The magic about the art of paper folding is that from the same sheet of paper one can create so many different objects. Unfortunately, the functionality of such paper artifacts resides only in the human imagination. The possibility to manufacture real functional objects following the principle of Origami would make engineering a child's play. In this spirit, we propose a technologically relevant concept addressing magnetic data storage: the lithographically defined shape of the magnetic object determines its magnetization reversal. Objects with identical composition and subjected to the same electric current undergo different magnetization reversal, due to their different geometry. The efficacy of this approach is proven by demonstrating bipolar switching, typically used in magnetic memories, but also prototype devices whose magnetic orientation depends entirely on their shape and not at all on the sign of the electric excitation. The concept of geometric switching enables the design of magnetic devices whose functionality is fully determined by the choice of their lithographic shape, the simplest and most flexible step in the fabrication process.

[1] Safeer C.K. et al. *Nature Nanotechnology* **11**, 143–146 (2016)