Sticky Random Walks TORU OHIRA, Sony Computer Science Laboratories, Japan, TADAAKI HOSAKA, National Institute of Advanced Industrial Science and Technology, Japan — Entangled strings is something we commonly observe. For example, wires for electrical appliances or communication network cords sometimes require us to disentangle them. We describe here a concept of sticky random walks to gain some insight into this phenomenon. The strings are represented by the trajectory of a random walker. This random walker leaves sticks or marks at certain time intervals. Therefore, a string is represented by this trajectory with these marks on it. By sending out multiple sticky random walkers, we obtained multiple sticky strings. Furthermore, a string is considered as entangled with another when these marks overlap at the same site in space, and not when they are simply crossed. Thus, the string is considered more sticky when there are more marks on it. We tested a situation having multiple sticky strings in a bounded two-dimensional square grid by sending out sticky random walks in this space. We found that in certain situations, the optimal balance between stickiness and number of strings gives most entangled situation.

Toru Ohira
Sony Computer Science Laboratories, Japan