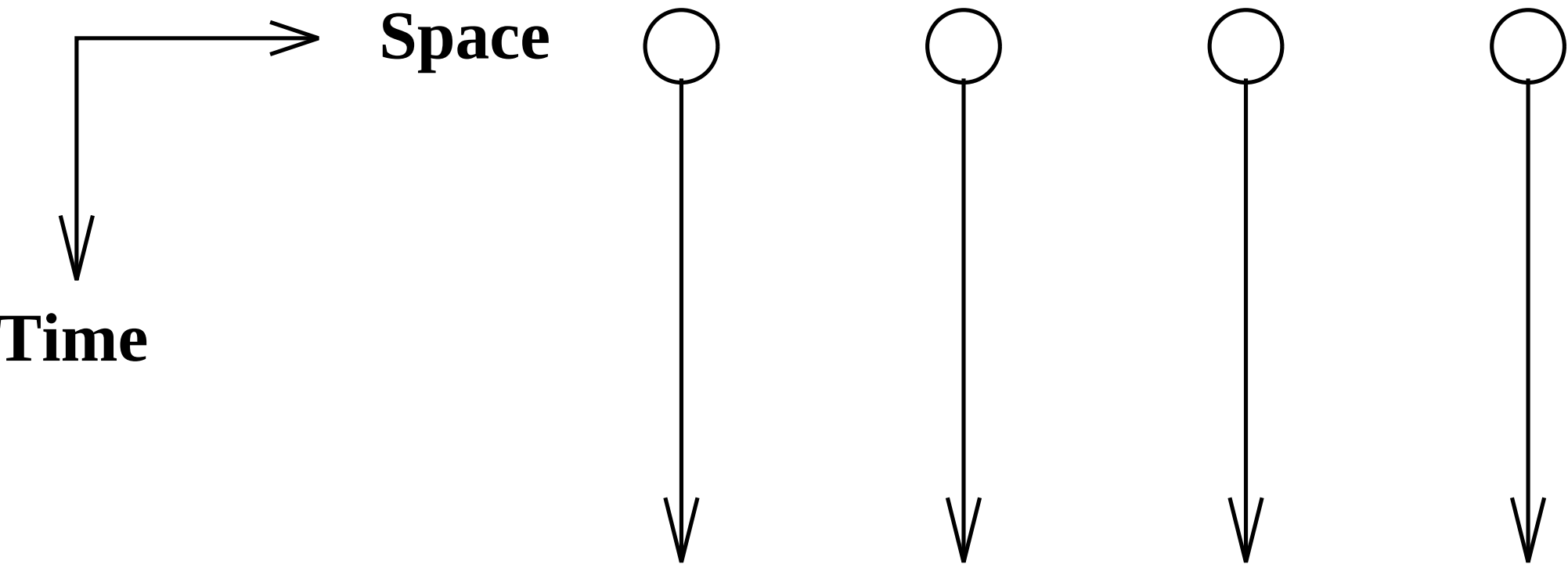Essentially Independent Parallel Processes