

## Dual-mode Operation of the Finger-type Manipulator Based on Distributed Actuation Mechanism

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### Abstract

Using the distributed actuation mechanism recently developed, this paper proposes the dual-mode operation of a finger-type manipulator that can switch between the force and velocity modes in order to achieve either the maximum force or the maximum velocity with the limited actuation power. The mathematical equations are derived for the fingertip force and velocity. Then, optimization scheme determines the maximum force and velocity that a finger-type manipulator can achieve at the given fingertip position along the given task direction. The numerical examples clearly demonstrate the effectiveness of the proposed dual-mode operation, which can enhance the operational efficiency of a manipulator in terms of velocity and/or force.