Introduction The hand is one of the essential parts of the human body, and it is useful for performing various functions in everyday life.Adaptive synergetic control is one of the most promising robust control techniques.The tendon drive was developed by Stanford University, while the connecting rod motor was developed by Iowa State University, USA .Low cost, high performance; simple design, aesthetics, and low weight definitely make the prosthesis get acceptable reliability for users and very promising for future development, (1) a biomechanical model of the index finger of the human hand is developed based on the human anatomy.Are studied in order to extract elements that are essential in the design of a biomechanically accurate hand,(3) The problem of decoupling between joints and the fixed synergy relationship of under actuated fingers, an adaptive and dexterous under actuated finger named the LMH finger was designed in this article.With a double tendon-pull eyed winding mechanism and a PEF gradient, the LMH finger provides three single-joint independent motion modes and four multi joint synergistic motion modes in a simple differential control of double driving forces,(4).Finally provides several suggestions for designing a control strategy able to mimic the functions of the human hand.(5) Stable grasping without slips or crushing is a major challenge for amputees who lose the natural sensorimotor system in dynamically changing daily life environments.Many designs have been classically proposed for implementation and control of such grippers, but bio-mimicking tendon based, under actuated Systems have been constantly discussed throughout the years on various platforms at multiple venues.A kinematic analysis of the proposed finger, which defines the relationship between the motion of its joints and the corresponding SMA artificial muscle contraction ranges, is studded by many researchers.a literature review of the control strategies of prosthetics hands with a multiple-layer or hierarchical structure, and points out the main critical aspects of the current solutions, in terms of human's functions replicated with the prosthetic device.The LMH finger has two degrees of actuation (DoAs) and three degrees of freedom (DoFs) based on the predefined elastic force (PEF) gradient, which actively changes the joint coupling relationship and the synergistic control structure.With the changes in the driving forces and external forces, the LMH finger is used to establish three conditional synergistic control (CSC) laws for the mutual transformation of adaptively and dexterity.Amputees rely largely on visual cues to control the prosthetic hand to complete daily living activities due to a lack of haptic feedback.Therefore, restoring these functions represents the primary goal of research by designing advanced machines that help amputees reduce effort and time.Since the activation of finger bones are carried out by tendons, a tendon configuration of the index finger is introduced and used in the model to imitate the human hand characteristics and functionality,(2).This work presents adaptive synergetic controller to control the joint variables of a constrained under actuated finger driven gripper mechanism.A comparative study between conventional synergetic controls and optimization synergetic control to demonstrate the superiority of the proposed method.The results of a torque analysis, carried out to evaluate SMA wire diameter and actuation forces required, is also presented.Conventional prosthetic hands are simple grippers that only restore the very basic grasping capabilities of the human hand.Here, a sensorimotor-inspired grasping strategy for a dexterous prosthetic hand is proposed to .(improve grasping performance,(6