Assisting manipulator energy storage

What is a mobile robotic manipulator system?
Mobile robotic manipulator system. The electronic components of the mobile manipulator robot are designed to interconnect all the control, power, and power supply equipment and elements.

What is a mobile manipulator?
The mobile manipulators unify the ability to hold objects and freedom of movement of the operating end in space(given by the robotic arm) with the displacement of the entire robotic system (given by the mobile platform).

What are the secondary objectives of a mobile manipulator control?
Therefore,one of the secondary objectives of the control is to maintain maximum manipulability of the mobile manipulator during task execution. Manipulability is a concept introduced by Yoshikawa (1985) to measure the ability of a fixed manipulator to move in certain directions.

What are the electronic components of a mobile manipulator robot?
The electronic components of the mobile manipulator robot are designed to interconnect all the control, power, and power supply equipment and elements. The design consists of eight Dynamixel motors, a computer, an electronic control board, overcurrent prevention elements, a peripheral extender, and a Lithium Polymer (LiPo) battery bank.

How can a mathematical element reduce energy consumption in a controller?
Sophisticated mathematical elements have been added to evaluate its action in the controller, and it has been demonstrated in experimental tests by a reduction of 8.76% of energy consumption in the tasks.

In view of the traditional engineering equipment manipulator problems such as gravitational potential energy waste and poor operation characteristics, a hydraulic-electric ...

China Mechanical Engineering >> 2022, Vol. 33 >> Issue (11): 1287-1293,1301. DOI: 10.3969/j.issn.1004-132X.2022.11.004 Previous Articles Next Articles Study and Optimization of Energy Storage Hydraulic Cylinders Synergistically Driving Heavy

The invention discloses a system for assisting a manipulator arm to work with a motion capture technology. The system comprises a manipulator module, a host computer for acquiring a control signal, a control communication module which is connected with the host computer, an upper sensor which is connected with the host computer, a lower processor which is connected with ...

Energy consumption is susceptible to minor variations in robotic manipulator"s states and environments during operations, in particular, the slow-paced changes in temperature and heat dissipation that could be caused by heat generation of motors, operational time, room temperature, and others, and these factors could

lead to drifts in the ...

A kind of power-assisted manipulator and all-pneumatic technology, which is applied in the field of manipulators, can solve problems such as inability to complete handling and blank damage, and achieve the effects of saving labor, reducing labor intensity and reducing production costs

: 10,6???:; ...

Another energy-efficient trajectory optimization model was proposed by Hansen et al. (2012), who considered not only friction losses but also the losses of servo drives and inverters. Meantime, the energy exchange between the robot joints via the coupled DC-bus was also calculated for the existence of recaptured electrical power.

Integrated robotic systems combining manipulators with mobile robots provide outstanding improvement opportunities for semi-automatic assembly processes leveraged by Industry 4.0. Factory...

Development of energy-saving manipulator using passive storage element and variable center of gravity mechanism???????????? ...

Abstract: This paper investigates feasibility of using a flywheel based energy recovery and storage system for a robotic manipulator. The incentive is supported by ever growing necessity for ...

This paper proposes a concept for the design and control of an energy saving manipulator utilizing passive elastic elements for energy storage. Firstly, we review our previously proposed method and the practical design of an energy saving manipulator briefly. This...

In this paper, a novel energy-saving control strategy is proposed for the accurate motion tracking of a hydraulic manipulator.

Kai Zhao"s 6 research works with 61 citations and 333 reads, including: Energy Distribution Index for robot manipulators and its application to buffering capability evaluation

Low cost, safe and high energy dense mechanically rechargeable zinc-air batteries for long-duration grid energy storage Akhil Kongara IIT Madras 15 16644 Technology for valorization of keratin waste to value added products Payal Yelne Institute of Chemical Technology 16 16409 Global navigational receiver semiconductor chip

An energy storage power assisting device and a warehousing robot. The energy storage power assisting device is used for a raising/lowering device of the warehousing robot. The raising/lowering device comprises a driving component and a driving shaft; the driving component controls the driving shaft to rotate so as to raise/lower goods; the energy storage power ...

Abstract: In this paper, a novel energy-saving control strategy is proposed for the accurate motion tracking of a hydraulic manipulator. To achieve independent pressure regulation for each ...

The invention provides a power assisting mechanism, wherein a hinged point is arranged at the lower end of a tail end posture maintaining intermediate body of a robot and below a hinged shaft of a first section arm and a second section arm of the robot, a power assisting cylinder is hinged, the power assisting cylinder is a power storage cylinder which has linear ejection performance ...

A human-assisting manipulator teleoperated by EMG signals and arm motions. O Fukuda, T Tsuji, M Kaneko, A Otsuka. IEEE transactions on robotics and automation 19 (2), 210-222, 2003. 698: 2003: A log-linearized Gaussian mixture network and its application to EEG pattern classification.

The application belongs to the technical field of robot joint structures and relates to a joint energy storage power-assisted mechanism, a robot joint structure and a robot. In the joint energy storage power assisting mechanism, the moving part is arranged in a rotating mode relative to the fixing part, the energy storage elastic part is connected between the two bases, and the switching ...

In this paper, we presents a manipulator with elastic elements for energy saving. With this manipulator the energy needed for driving the manipulator to lift a certain load decreases, so ...

The manipulation of the displacement velocity of a robot allows a most effective use of energy, an example shows in Minitti, et al. ; likewise, in robotic systems composed of ...

The invention provides a power assisting mechanism, which is characterized in that a hinge point is arranged at the lower end of a tail end gesture maintaining intermediate body of a robot and below a hinge shaft of a first section arm and a second section arm of the robot, a power assisting cylinder is hinged, the power assisting cylinder is a linear ejection power storage cylinder for ...

Industrial robots, like all machines, require energy to operate, which is why energy efficiency in industrial robotics has been a subject of consideration in recent years in many scientific and industrial centers. Interest ...

Aiming at the method of using energy storage hydraulic cylinders to coordinate the lifting of the heavy manipulators to realize the gravitational potential energy recovery and ...

Operational capacity: The mobile manipulators available on the market have a limited load capacity on the manipulator arm. The one with the highest load capacity currently available is Robotnik"s RB-ROBOUT+ which ...

Synergistic dual conversion reactions assisting Pb-S electrochemistry for energy storage Pb-S () ...

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Abstract. Developing robotic systems for reducing the dependence of elderly on personal assistance is one of the most recent hot topics in robotics research. This paper proposes a multifunction mobility assistive device, which consists of an assisting parallel manipulator carried over an active walker. It is developed to interactively assist in various lower limb activities, ...

The European Robotic Arm (ERA) will be launched to the International Space Station together with the Russian Multipurpose Laboratory Module, called "Nauka". ERA is the first robot able to "walk" around the Russian segment of the Space Station. It has the ability to anchor itself to the Station and move back and forward by itself, hand-over-hand between fixed base-points. This ...

The invention relates to the technical field of energy storage battery loading and unloading modules, in particular to a manipulator for installing energy storage container batteries. The manipulator for mounting the energy storage container battery adopts a hidden mounting layout, is directly mounted at the lateral loading and unloading port on the container body, can be ...

To optimize the mechanical arm target capture and classification of the open multiple-view (MV) visualization program, the open MV visualization programming and deep learning detection method combined with the different capture strategies of robotic arm, a method to extend the research is proposed. For the proposed sorting robot"s multi-cargo grasping, the analysis ...

11. Energy Storage and Management. Efficient energy storage and management are pivotal for maintaining a robot"s operational longevity and performance. 11.1. Battery Technologies. Advancements in battery technology, such as solid-state batteries, promise higher energy densities and improved safety, extending the operational time of mobile ...

Figure 1 shows the configuration of the proposed energy-saving manipulator. In the proposed method, the joints must be able to rotate freely in order to use the natural vibration of the system, and motors cannot be installed in the joints like a normal manipulator.

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