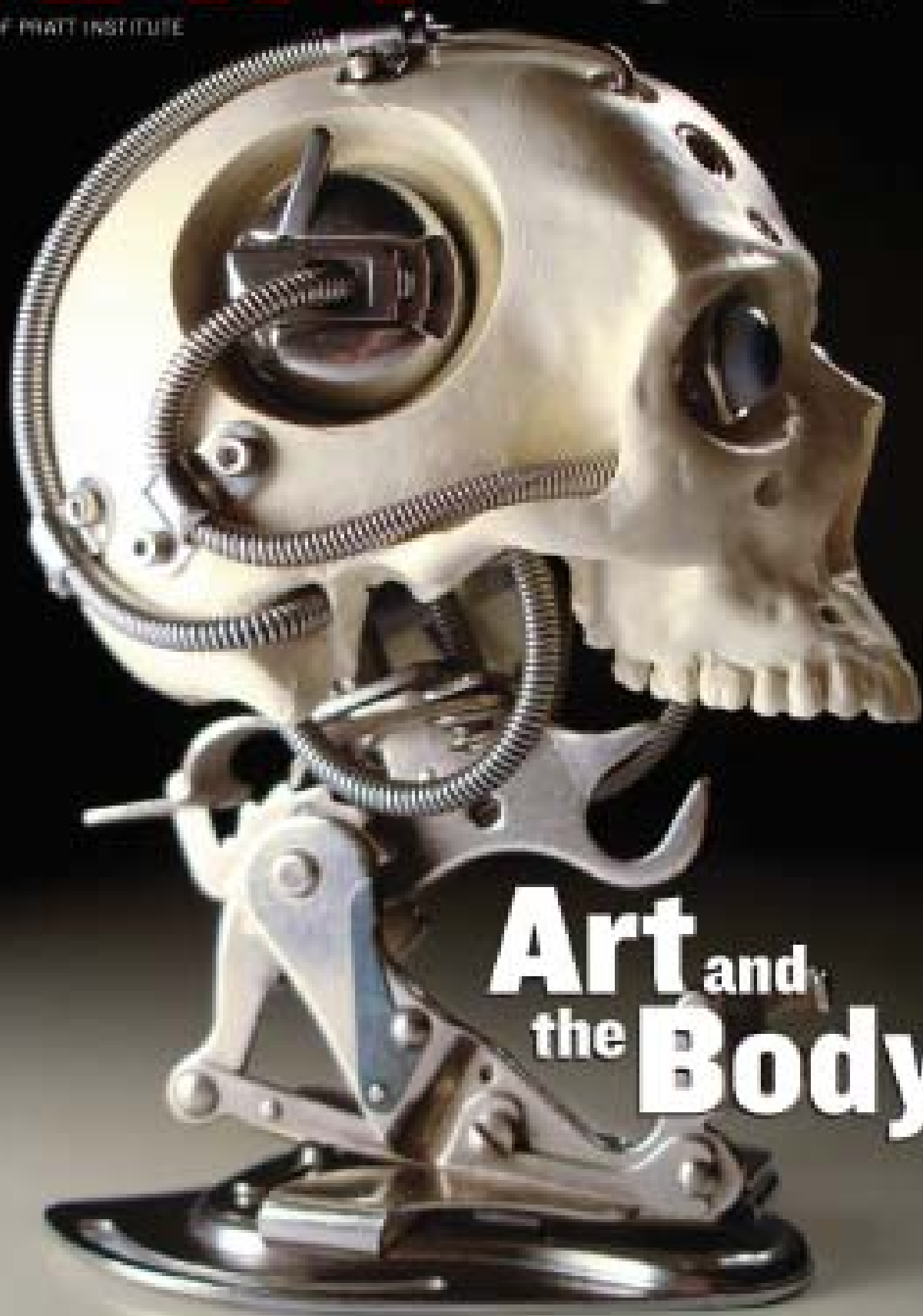


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# PRATT FOLIO

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## Art and the Body

**Basic Training:** The Human Form | **Our Bodies:** ourselves  
**Design for Happier, Safer Lives | The Body as Canvas**



## 18 **Design for Happier, Safer Lives** Student- and alumni-designed products that protect the body and assist those with a range of abilities

### EXERCISE GEAR FOR QUADRIPLÉGIC WHEELCHAIR RUGBY PLAYERS

Yuki Hirayama, M.I.D., '07

**FUNCTION:** Allows athletes who use wheelchairs to regularly and inexpensively exercise with no assistance.

**INSPIRATION:** Hirayama watched the popular 2005 documentary *Murderball* about the fast-paced, full-contact sport of wheelchair rugby, with awe. At first, she was shocked by the "recklessness" of quadriplegic players who routinely crashed their wheelchairs into each other at full speed—but she soon found herself fascinated by the sport. As an athlete, she could relate to the passion of the players, but she was curious about the special exercise needs of those with spinal cord injuries.

Hirayama interviewed players at various levels of competition and found that they shared several challenges. Since most spend much of their days in wheelchairs, they overuse the muscles used to move themselves about, resulting in chronic fatigue and long-term damage to their muscular anatomy. This can be prevented by exercising the muscles that oppose those engaged in pushing the chair forward, but it is often difficult for players to find time to go to a gym and portable equipment is hard for individuals with spinal cord injuries to use without assistance.

Hirayama designed small, easy-to-use pieces of equipment that would have a big impact on the strength-training efforts of these athletes. These included weighted gloves with an easy-to-change elongated weight bar and an exercise band consisting of a series of rubber hoops. This band allows the athletes to exercise their chest muscles that oppose the back muscles engaged in pushing their chairs.

