OC Robotics

Snake-arm robots for confined and hazardous spaces

FOR VIDEO AND FURTHER INFORMATION FOLLOW THE HYPERLINKS ON EACH PAGE

In-Space Non-Destructive Inspection Technology Workshop
29th February - 1st March 2012
OC Robotics

Royal Academy of Engineering Silver Medal 2009

The company
Snake-arm robot

Reaching the unreachable

Borescopes

Snake-arm robots

Industrial robots
Snake-arm robot
General design

Tip for tools
Link
Cables
Base
Hollow core
Snake-arm robot Actuation

Cable drive system
Snake-arm robot
General design

- Slender arms using wire rope (tendon) drive
  - Efficient, simple and robust
  - Lightweight, slender arms
- Many joints (20 degrees of freedom) and ‘no elbows’
- Intuitive ‘nose-following’ operation for obstacle avoidance
- Quick release, exchangeable arms

- Robust, easily sealed arms
- Hollow arms for tool services supporting a wide range of inspection and process tools
- Payload dependent on diameter
- Actuators/electronics outside hazardous area
- Remote tele-operation or pre-programmed control
Snake-arm robot
Turnkey projects

- Tracked vehicle rotating drum
- Portable rotating drum
- Rail&Rotate
- Industrial Robot
Snake Arm Simulator

Try your hand at controlling a snake-arm robot in a variety of environments!

Download for FREE from our website
What we offer

• **Complete bespoke systems**
  - Comprehensive feasibility study
  - Hardware
  - Documentation
  - Training

• **Robotics services**
  - Explorer solutions
  - ROVs
  - System integration
  - Custom end effectors

• **Consultancy services**
  - Concept studies
  - Commercial analysis
  - Demonstration events
• Customer: Defence Threat Reduction Agency (US)
• Task: Small snake-arm robots
• Snake-arms delivered:
  - 12.5mm diameter (0.5 inch)
  - 600mm in length
  - Coiled up inside briefcase-sized pack
  - Controlled remotely via laptop
Completed project
Ringhals

- Customer: Ringhals AB (Sweden)
- Task: Urgent pipe replacement in extremely awkward area of plant
- 2 snake-arms delivered:
  - Manipulation Arm (above right)
    - 800mm length; 60mm diameter
    - Delivered tools and fixtures, manoeuvred old/new pipes, conducted welding and UT inspection
  - Inspection Arm (below right)
    - 1000mm length; 35mm diameter
    - Obtained ideal camera location to monitor operation
Completed project

Ontario Power Generation

- Customer: Ontario Power Generation (Canada)
- Task: Inspection of pipe work in the Upper Feeder Cabinets of CANDU reactors
- Objectives
  - Reduce operator dose
  - Shorten outage time
  - 100% coverage of environment (from ~10%)
Completed project
Nuclear Decommissioning

• Customers: Sellafield Ltd (UK); Areva NC (France)
• Task: Demonstrate remote handling capability of snake-arm robots

More info on Sellafield project, including video
More info on Areva project, including video
Completed project LaserSnake

• Customers: Technology Strategy Board (UK)
• Task: Demonstrate integration of a 5kW fibre laser with a snake-arm robot

Video of LaserSnake
Further video and information is available from our website or YouTube channel

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