# Da Vinci Research Kit (DVRK)

The da Vinci Research Kit (dVRK) is a research platform based on the da Vinci Surgical System developed and distributed by Intuitive Surgical Inc. The kit is a collection of first-generation da Vinci components that can be used to assemble a telerobotics platform which provides complete access to all levels of control via open source electronics and software. The platform consists of a surgeon's console to tele-operate the surgery and a patient side system where the surgery takes place. The surgeon's console consists of two Master Tool Manipulators, each having 8 DOF for dexterous and natural hand manipulation, and a foot-pedal tray. On the other side at the patient's end, there are two Patient Side Manipulators, which are controlled by the two Master Tool Manipulators. The interface between the two components is based on custom hardware consisting of motor-controllers, coupled with FPGAs and connected to a PC running the control loops.The DVRK can be exploited for interfacing with different master manipulators, for testing force-feedback strategies, of for the integration on novel tools for surgery.

## Key Features

- External viewer
- Open access to all level of control
- Console + two robotic arms (8DOF)
- Teleoperation robot
- RS-232 (over USB) and Bluetooth communication

## Possible Applications

- Better estimation of interaction forces during surgical procedures (e.g. integration of haptic feedbacks)
- Development of innovative control strategies (e.g. new algorithms for dynamic parameters identification)
- Development of innovative robotic tools (e.g. Surgical Manipulation, Surgical Interventions/Tasks, Haptics)

# Access information

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| **Corresponding infrastructure** | School of Advanced Studies Sant'Anna<br>The BioRobotics Institute |
| **Location** | Viale Rinaldo Piaggio, 34<br>56025 Pontedera PI, Italy |
| **Unit of access** | Working day |

# Technical specifications

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|---|---|
| **Control** | Open source platform |
| **DoF** | 16 (slave arms) |
| **Software** | ROS |

# Additional information

http://research.intusurg.com/dvrkwiki/index.php?title=Main_Page