

# List of Abbreviations

ABU	Asian Broadcasting Union	ISO	International Standard of Organization
AC	Alternating Current	ISRO	Indian Space Research Organization
ADC	Analog-to-Digital converter	JIRA	The Japan Industrial Robot Association
AGV	Automatic Guided Vehicle	JV	Joint Variable
BRA	British Robot Association	KE	Kinetic Energy
CCD	Charged Coupled Device	KRL	KUKA Robot Language
CID	Charge Injection Device	LED	Light Emitting Diode
CMERI	Central Mechanical Engineering Research Institute	LSPB	Linear Segments with Parabolic Blend
CNC	Computer Numerical Controlled	LSI	Large Scale Integrations
CP	Continuous Path	LTI	Linear Time Invariant
CPL	Computer Programming Language	LVDT	Linear Variable Differential Transformer
CPU	Central Processing Unit	MCI	Matrix of Convective Inertia
CSG	Constructive Solid Geometry	MDH	Modified DH parameters
D	Derivative	MIMO	Multi-Input Multi-Output
DAC	Digital-to-Analog converter	MOS	Metal Oxide Semi-conductor
DAE	Differential Algebraic Equations	MTTF	Mean Time to Failure
DAQ	Data Acquisition	MTTR	Mean Time to Repair
DC	Direct Current	NASA	National Aeronautic Society of America
DeNOC	Decoupled Natural Orthogonal Complement	NC	Normally Closed
det.	Determinant	NE	Newton-Euler
DH	Denavit and Hartenberg	NO	Normally Open
DOF	Degrees-of-freedom	NOC	Natural Orthogonal Compliment
DRDO	Defence Research and Development Organization	ODE	Ordinary Differential Equations
DSP	Digital Signal Processing	OLP	Off-line Programming
EL	Euler-Lagrange	P	Proportional
EMF	Electromotive Force	PAR	Programme for Autonomous Robotics
FKin	Forward Kinematics	PD	Proportional-Derivative
GIM	Generalized Inertia Matrix	PE	Potential Energy
HaPRA	Hanging Planar Robotic Arm	PI	Proportional-Integral
HTM	Homogeneous Transformation Matrix	PID	Proportional-Integral-Derivative
IDyn	Inverse Dynamics		
IKin	Inverse Kinematics		

PLC	Programmable Logic Controller	RUR	Rossum's Universal Robots
PM	Permanent Magnet	RVDT	Rotary Variable Differential Transformer
PO	Percentage Overshoot		
PR	Prismatic-Revolute	SCARA	Selective Compliance Assembly Robot Arm
PSD	Position-Sensitive Detector		
PTP	Point-to-Point	SBED	Shoulder-Back/Elbow-Down
PUMA	Programmable Universal Manipulator for Assembly	SBEU	Shoulder-Back/Elbow-Up
		SFED	Shoulder-Front/Elbow-Down
RA	RoboAnalyzer (software)	SFEU	Shoulder-Front/Elbow-Up
RAM	Random Access Memory	SiRoD	Simple Robot Designer
ReDySim	Recursive Dynamic Simulator	SISO	Single-Input Single-Output
RIA	Robotics Institute of America	SLI	Structural Length Index
RIDIM	Recursive Inverse Dynamics for Industrial Manipulators	SPD	Symmetric Positive Definite Transfer Function
		TF	
RNE	Recursive Newton-Euler	WMR	Wheeled Mobile Robot
ROBOCON	ROBOTic CONtests	VCI	Vector of Convective Inertia
ROV	Remotely Operated Vehicle	VLSI	Very Large Scale Integrations
RP	Revolute-Prismatic	5P	Proper Planning Prevents Poor Performance
RPL	Robot Programming Language		