

Curriculum Vitae

Somnath Pan Professor Department of Electrical Engineering Indian Institute of Technology (ISM), Dhanbad – 826004 INDIA		+91-326-223-5451 (Office) +91-9431124647 (Mobile) somnathpan@iitism.ac.in																										
Specialization:	Control Systems & Instrumentation																											
Research Interest:	Reduced order modelling & controller design for Process control and Power system applications.																											
Experience:	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 30%;">Organization</th> <th style="width: 30%;">Position</th> <th style="width: 20%;">From</th> <th style="width: 20%;">To</th> </tr> </thead> <tbody> <tr> <td rowspan="7" style="text-align: left; padding: 5px;">Indian Institute of Technology (ISM)</td> <td>Lecturer</td> <td>25-09-1995</td> <td>21-02-2000</td> </tr> <tr> <td>Assistant Professor</td> <td>22-02-2000</td> <td>31-12-2005</td> </tr> <tr> <td>Associate Professor</td> <td>01-01-2006</td> <td>31-12-2009</td> </tr> <tr> <td>Professor</td> <td>01-01-2010</td> <td>Continuing</td> </tr> <tr> <td>Head of the Department</td> <td>28-02-2011</td> <td>25-02-2014</td> </tr> <tr> <td>Head of the Department (Acting)</td> <td>20-11-2018</td> <td>23-12-2018</td> </tr> <tr> <td>Associate Dean (Acad)</td> <td>18-04-2017</td> <td>20-09-2018</td> </tr> </tbody> </table>		Organization	Position	From	To	Indian Institute of Technology (ISM)	Lecturer	25-09-1995	21-02-2000	Assistant Professor	22-02-2000	31-12-2005	Associate Professor	01-01-2006	31-12-2009	Professor	01-01-2010	Continuing	Head of the Department	28-02-2011	25-02-2014	Head of the Department (Acting)	20-11-2018	23-12-2018	Associate Dean (Acad)	18-04-2017	20-09-2018
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M.E.E. Thesis:	<i>“Development of a PC based pattern digitizer”</i> This is a PC based system to collect digital data representing the boundary of a pattern. The pattern is sensed optically (using infra-red radiation) and co-ordinates of the pattern boundary are digitized to store in a data file and then processed by using an effectively two-dimensional moving median filter to remove noise. The hardware of the scanner comprises of a simple X-Y plotter, the pen of which is replaced by an opto-reflective sensor. The contour tracing algorithm developed for driving the scanner along the pattern boundary is robust enough to cope up a good amount of hardware defects (e.g. backlash of the scanner driving system). Software has also been developed for computation of the area enclosed by the pattern boundary. All the softwares developed are interactive in nature and with on-line display facility.
Ph.D. Thesis:	<i>“Some frequency domain methods for reduced order modelling and digital controller design”</i> Two methods have been developed for model order reduction in z-domain, namely – (a) Approximate Generalised Time Moment matching and (b) Approximate Frequency Response matching methods which have been employed for digital controller design (SISO and MIMO). The methods have been extended to reduction of digital controllers and discretization of analog controllers. The design methods use output feedback only and call for the solution of linear algebraic equations. The methods work with the transfer function description of the control systems and do not require any elaborate frequency response analysis.
R&D Project:	“Computer controlled energy efficient LSHT output hydrostatic drive for mining equipment using proportional solenoid valve technology”, sponsored by MHRD 2003-2006. (Co-PI) “Design and development of energy efficient hydrostatic transmission system for off-road vehicle using two motor summation drive”, sponsored by UGC, 2009-2012. (Co-PI) “Development of a load-frequency control system with a PID controller designed through a frequency-domain matching method” sponsored by UGC, 2013-2016. (PI)

Ph.D. Guidance:	Awarded: “PID controller design for linear time-invariant industrial systems”. “Damping controller design for mitigating the small-signal oscillations in power systems using frequency response matching technique”. “Frequency domain reference model based PI/PID controller design for linear time invariant SISO and MIMO industrial systems”. “Development of low-order controller design method for LTI systems using model matching techniques”. Ongoing: “Load frequency control in power system”. “Load frequency control with communication delay and cyber attack”.	
Teaching In Winter 2024-25	Electrical Measurements (EEC205) Control and Measurement Lab (EEC273)	
Subjects Taught:	For Electrical students (UG): •Control Systems I •Control Systems II •Digital Signal Processing •Signals and Systems •Electrical Technology •Simulation Lab •Electrical Technology Lab For Electrical students (PG): •Advanced Control System •Industrial Instrumentation •Advanced Control System Lab	For Non-Electrical students: •Electrical Technology •Circuits and Measurements •Measurements & Instrumentation •Mechanical Measurements •Electrical Machines and Control •Electrical Drives •Applied Electrical Engineering •Electrical Power Utilization
Laboratory Development:	Simulation Lab, Control Systems Lab, Measurement Lab, Instrumentation Lab, Circuit Lab, Electrical Technology Lab	
Other Activities Accomplished	Member, Building and Works Committee Associate Dean (Acad)-PG Chairman/Member, M. Tech. Admission Committee, IIT(ISM) In-Charge/Member, JAM, IIT(ISM) In-Charge of GATE-JAM Exam, IIT(ISM) Member, Electrical Installation Committee Chairman, Committee for ROW for drawing DVC Power Line In-Charge, Telephone Systems, Member, Core Course Committee Hostel Warden	