WEB BASED EXPERIMENTATION

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MOTIVATION

- Students interest towards web related information
- My interest towards networking
- Easy way to get things done

CONTENTS

INTRODUCTION

- Remote Lab Experiment on “Stress, Strain and Vibration Analysis of a Cantilever Beam System”.
- Structure of Remote Laboratory
- Multiple Users Remote Access

EXPERIMENTATION SETUP

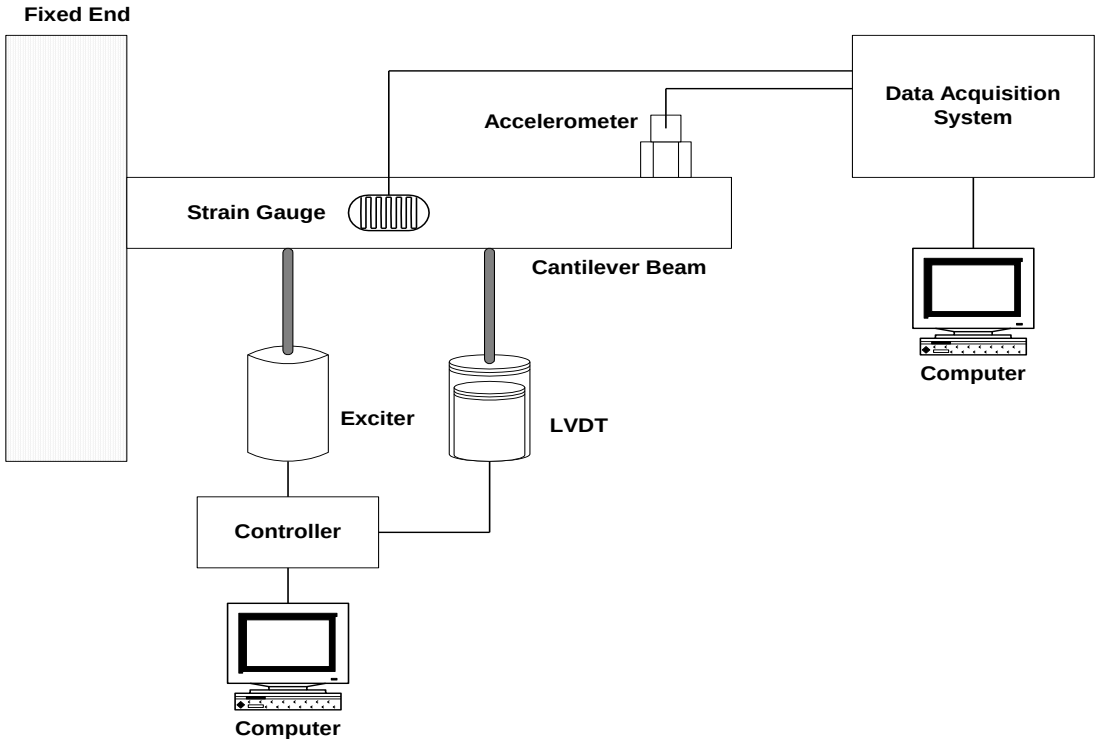


Fig. 1 Experimental Set up of the Cantilever Beam

SYSTEM ARCHITECTURE

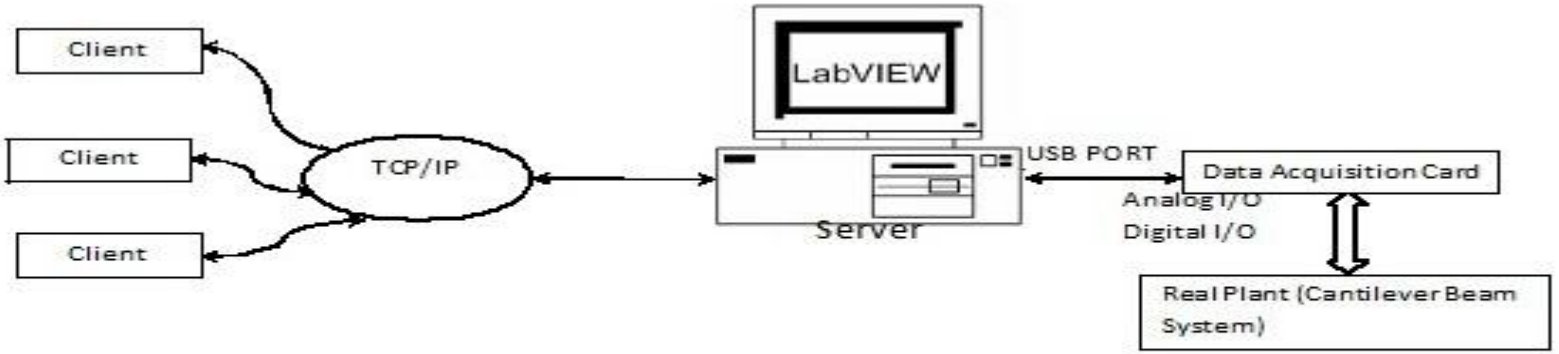
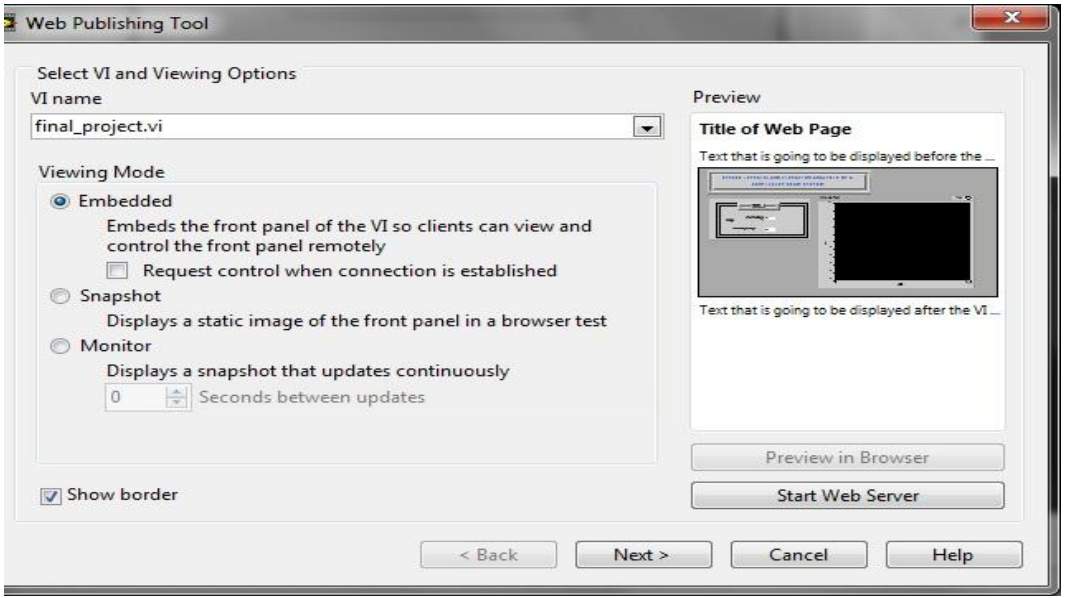


Fig. 2 Remote Laboratory Block Scheme Using Data Acquisition Card[Modified from S.Uran, D.Hercog and K.Jezernik, Remote Lab Exp. RC Oscillator]

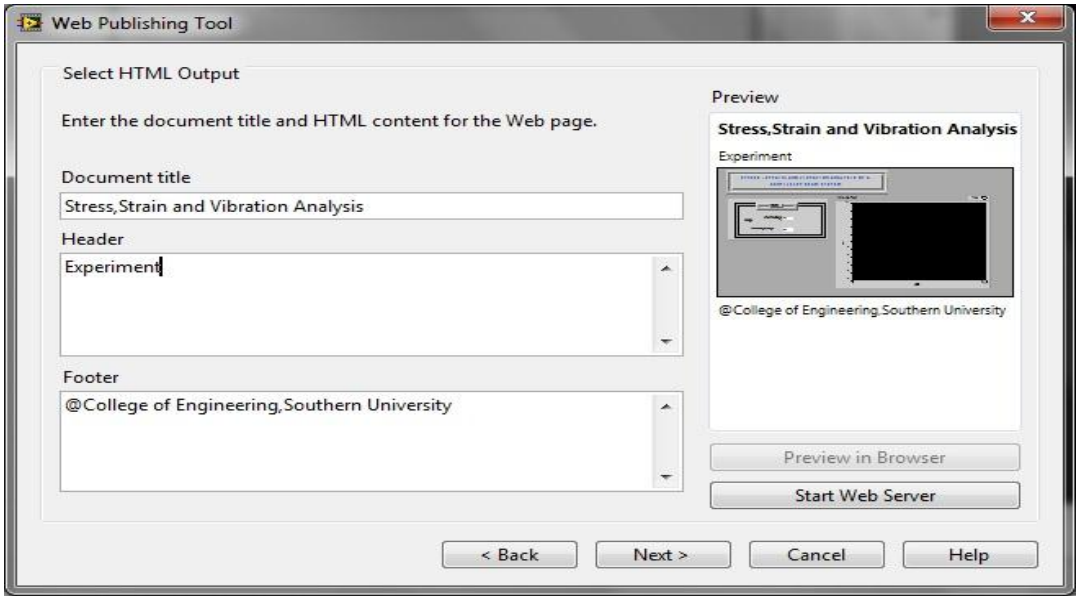
LabVIEW Operation

- Server Operation (Web Publishing Tool) :
  - Step 1 : Creating & loading the VI



LabVIEW Operation

- Step 2 : Entering – Document title, header & footer

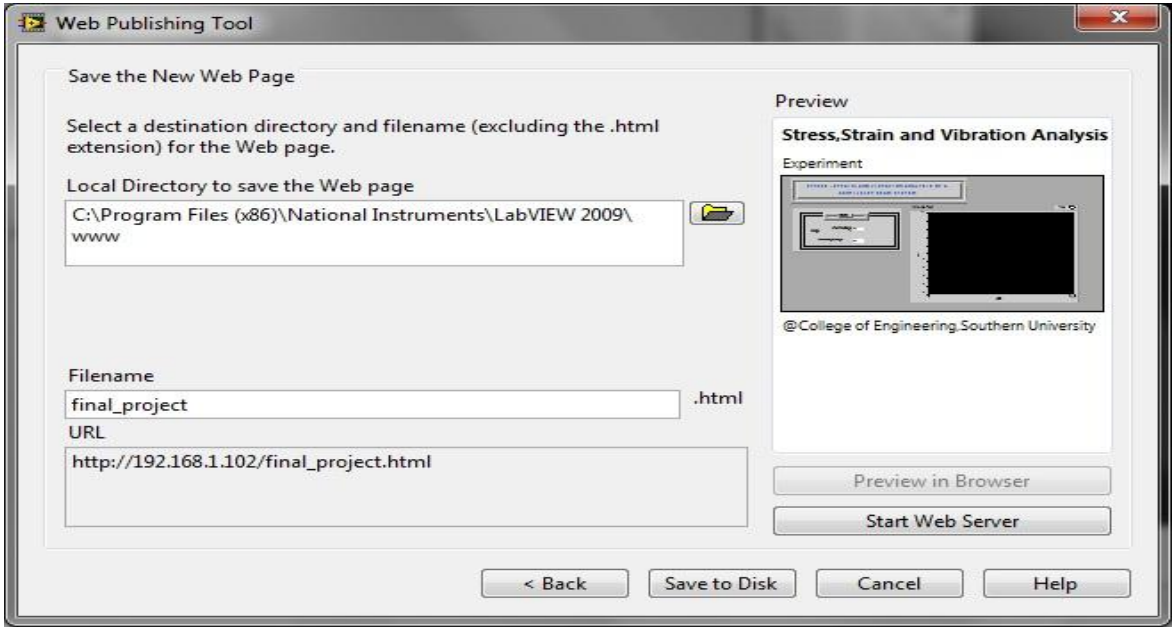


LabVIEW Operation

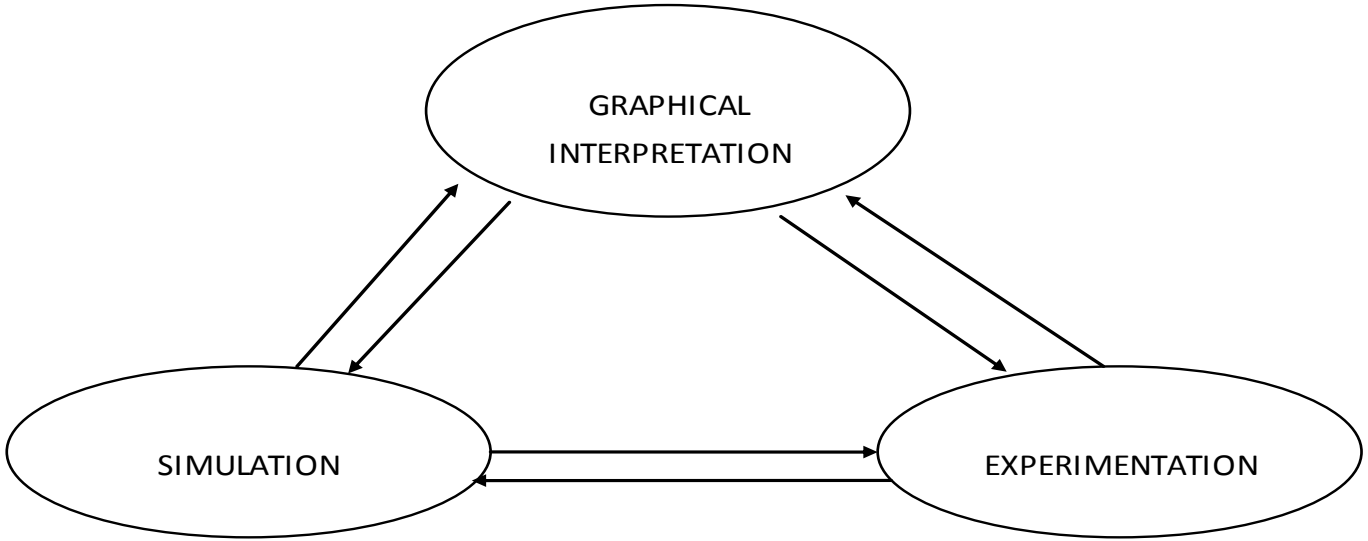
- Client Operation :
  - LabVIEW Run Time Engine
  - Controller Parameters & send Experimental Results through Email
- Application Control:
  - Request Control
  - Release Control

LabVIEW Operation

- Step 3 : Start Web Server, Obtain the URL & Save to Disk

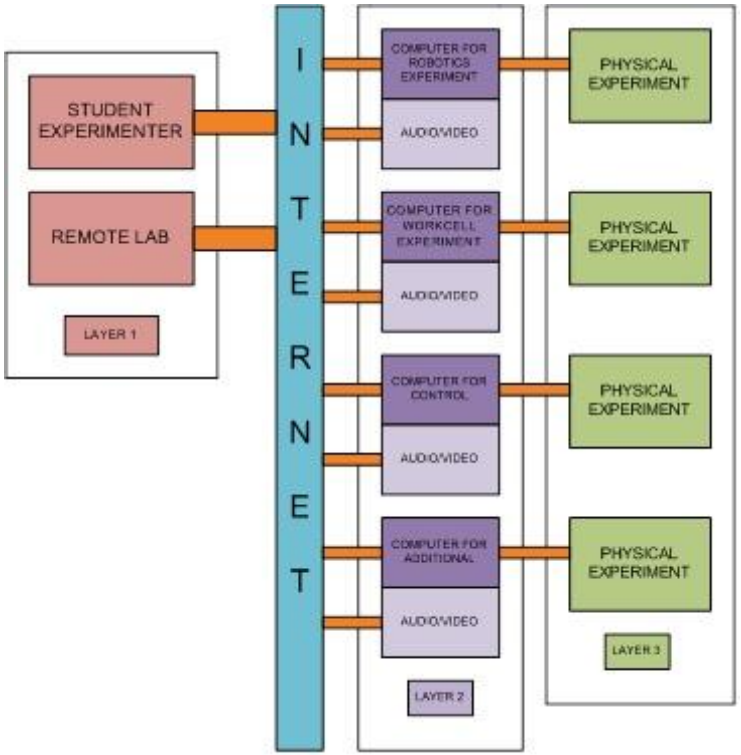


SIMULATION AND GRAPHICAL INTERPRETATION



DEVELOPMENT OF IT INFRASTRUCTURE

- Communication Infrastructure :
  - Experimental Apparatus
  - Workstation Servers
  - Remote Laboratory Server
- Network Axis Camera – to View
- Select, View and Run the equipment

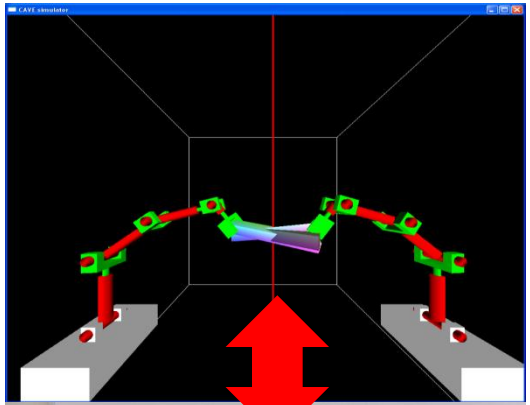


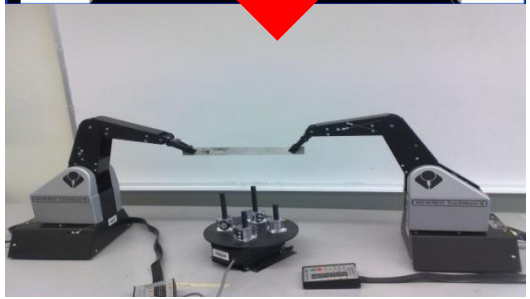
CONCLUSION

- Remotely accessing the experiment
- Crystal Clear Understanding with different options

Possible Extensions Of Ongoing Work

Steering robots in the Mechatronics Laboratory





Remote steering of parallel computations and concurrent visualization

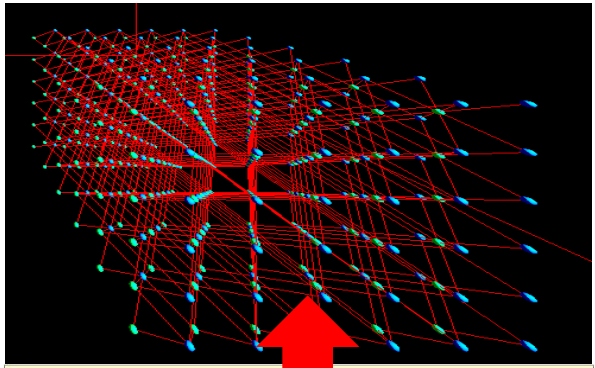
Pathlines in CFD data

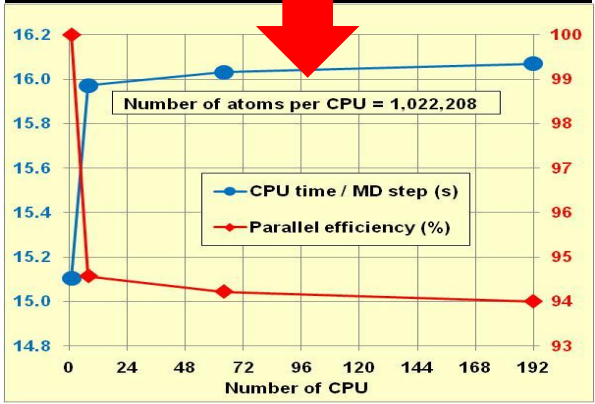
Ongoing work

CFD data: Pre-computing pathlines on parallel machines

- **Pathlines for the full simulation time (~5700 CFD time steps) pre-computed to avoid disk access limitation.**
- **~0.5 million pathlines beginnning from points of a uniform grid computed in ~2.64 hrs on 64 CPU of LONI machine Queenbee.**
- **Reordering of computed pathlines to have all time steps of an individual pathline in a single block completed in 0.32 hrs on 64 CPU of Queenbee.**
- **Modification of the visualization code to read pre-computed pathlines based on user supplied seed points/surfaces.**

Molecular Dynamics simulations





Acknowledgements

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Thank You For Your Attention

Questions