

## **Advanced Training, Bosch Rexroth, AG Germany Report 2018**

I, Associate Prof. Vinod S. Jain, along with participants from countries like Sweden, Belgium, UAE and Dubai successfully completed the advanced training on latest technologies in Industrial Automation at Bosch Rexroth, AG, Germany from 17<sup>th</sup> September 2018 to 21<sup>st</sup> September 2018

Bosch Rexroth, a world leader in the field of Industrial Automation, certified us as the Advanced Trainer in Industrial Automation on Continuous valve technology with Analog and Digital control electronics including servo valve technology.

We were given projects to complete challenging tasks in Industrial Automation like complex press system using on-board electronic ramp times, functioning of valves used in shipping application, and industrial applications like Car manufacturing for closed loop pilot control. It was a perfect opportunity to update domain knowledge and at the same time keeping in pace with the latest Industry trends.

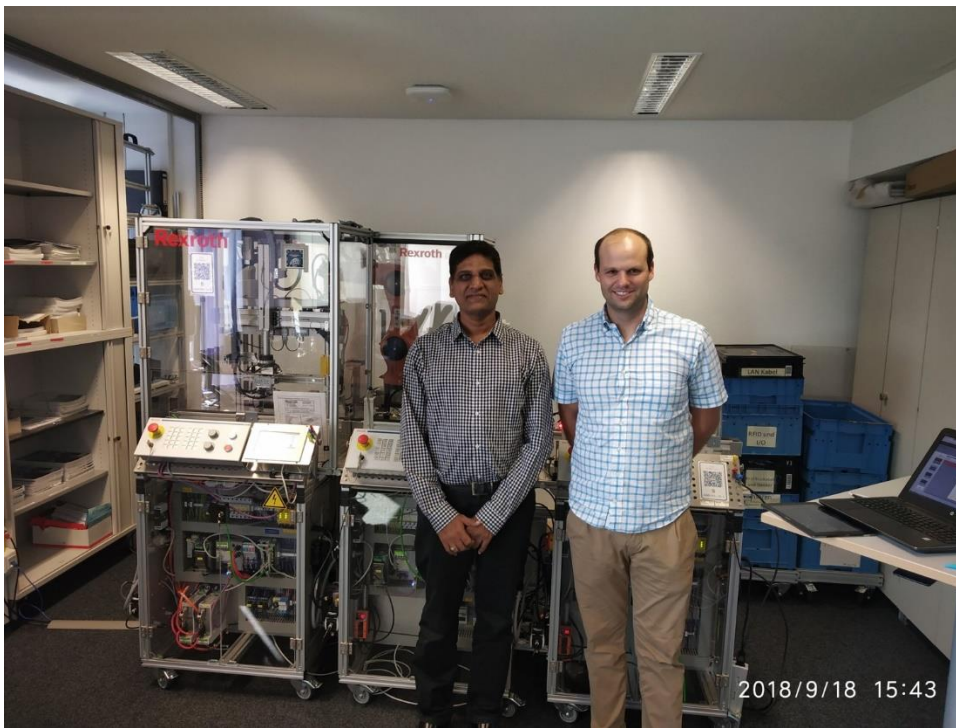


**With participants and Trainer Mr. Heiner Fitschen.**

Mr. Heiner Fitschen is the Trainer from Drive and Control Academy, Bosch Rexroth, Wurzburg, Germany.

Participants drawn were mainly Commissioning, Application and development engineers posted in their respective countries.

Different exercises were given to the participants, which can be now implemented with appropriate guidance for Technology Development Programs conducted here at NMIMS Bosch Rexroth Centre of Excellence in Industrial Automation Technologies, MPSTME Mumbai.



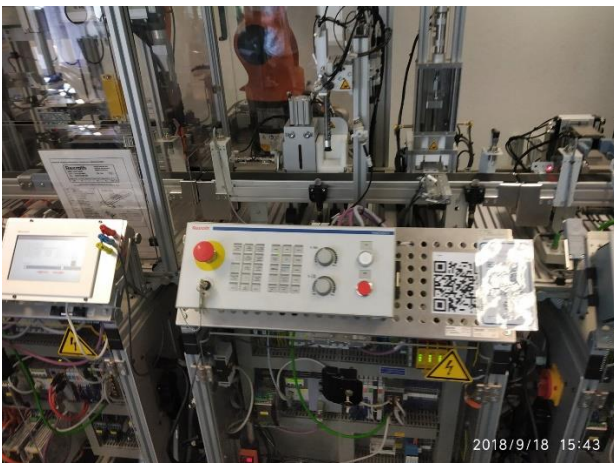
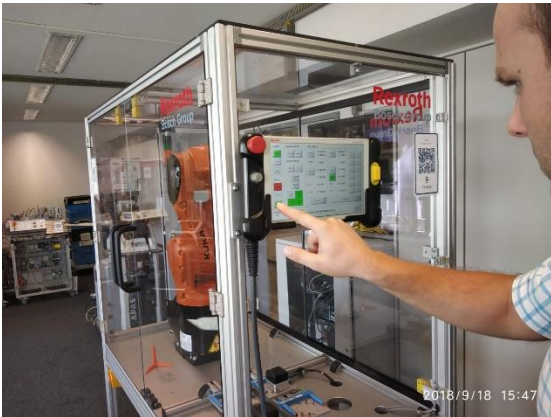
**With Michael Burst, Bosch Rexroth, Germany**

This extensive training to keep abreast with the latest trends in Robotics and Automation also gives me the opportunity to evaluate and upgrade our existing Centre of Excellence labs here at MPSTME Mumbai.

Interesting up-gradations worth considering are for eg. Industry 4.0 compliant PLCs for Motion control, servo drives, Mobile hydraulics and Proportional valves with Digital Amplifier card, XDK Sensor IoT Gateway 4.0(Cross Development kit for Education).



**APAS Collaborated Industry Robot (No casing required, Touch sensitive)**

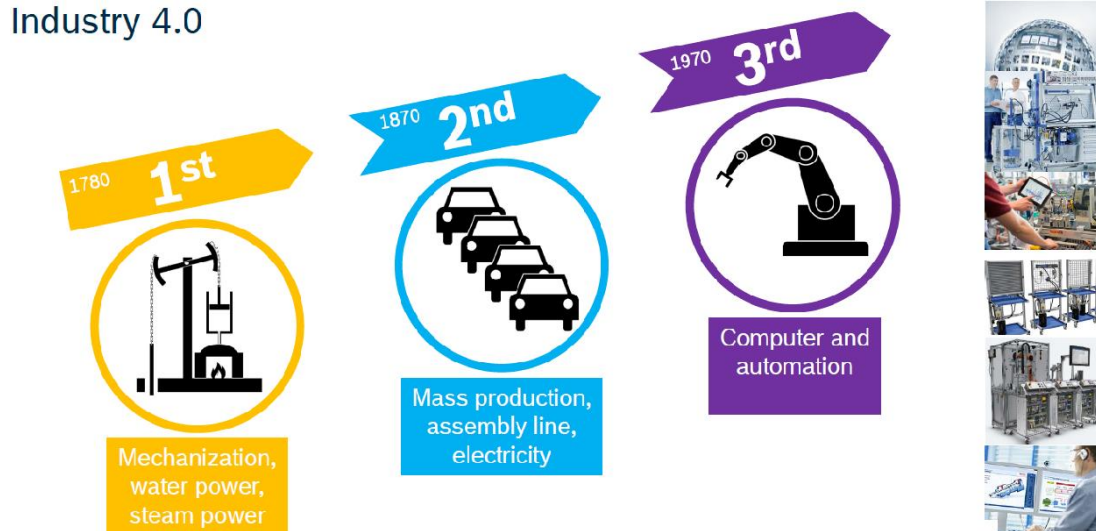


**Kuka Robot with Bosch Rexroth Mechatronics Kit Industry 4.0 compliant**

## Industry 4.0 describes the **merging** of industry and IT

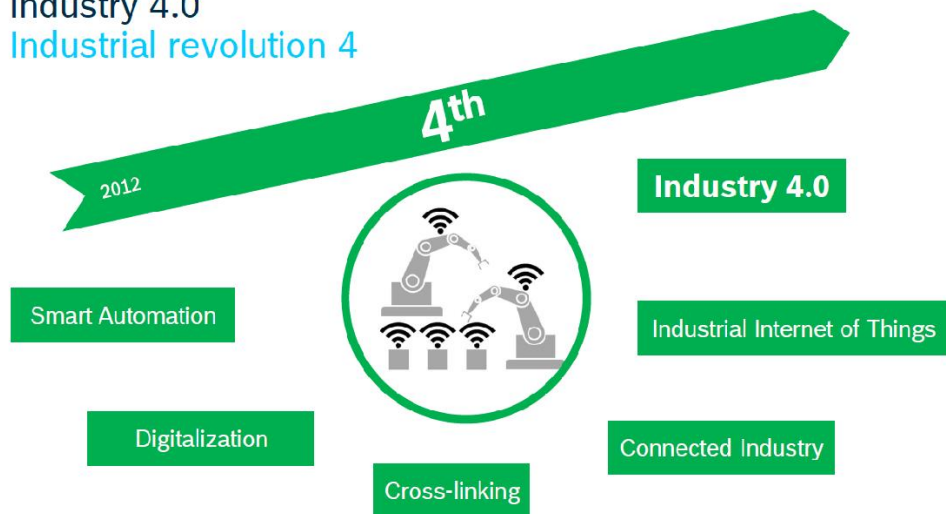
Existing industrial techniques are better combined and with IT techniques enriched in order to achieve added value in the production

### Industry 4.0



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### Industry 4.0 Industrial revolution 4



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**Quadcopters at Media Markt**

## **Report - Advanced Training, Bosch Rexroth, Germany**

**Module:** Continuous valve technology with Analog and Digital control electronics including servo valve technology.

**Trainer:** Mr. Heiner Fitschen, Drive and Control Academy, Bosch Rexroth, Germany

**No. of days:** 5

**Dates:** 17<sup>th</sup> Sept. 2018 to 21<sup>st</sup> Sept. 2018

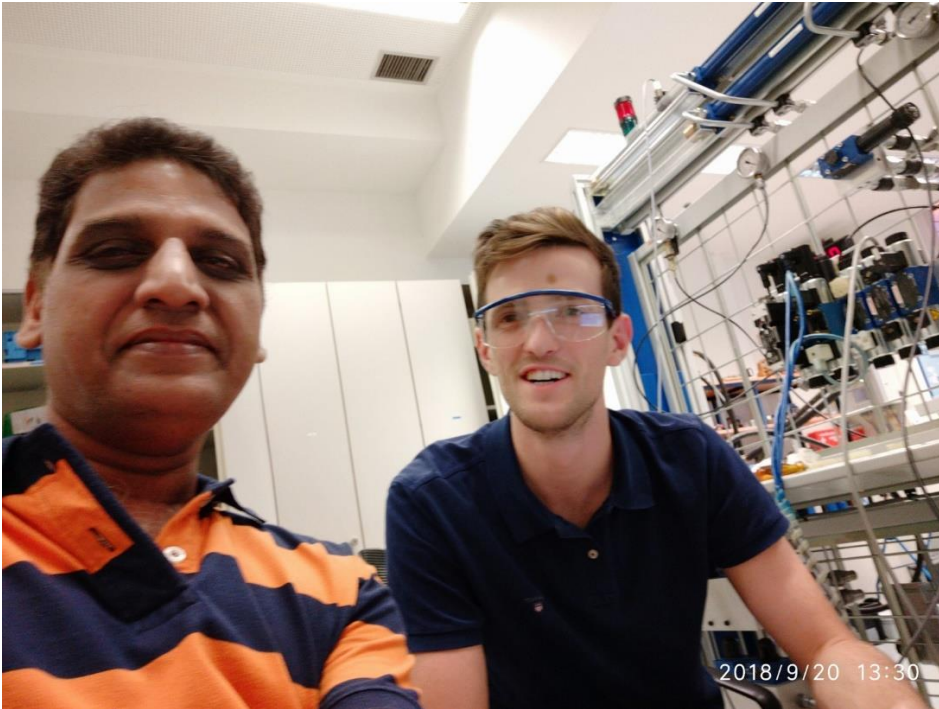
Proportional valve technology with open-loop (non-feedback) and closed loop control. Current controlled devices like force controlled solenoids and stroke controlled solenoids,

LVDT (linear variable differential transformer) were given for Hysteresis and ramp command for amplifiers (Euro card and modular), repeatability for nominal flow with zero overlap and positive overlap.

Proportional DCV with Pilot control, Pressure Relief Valve (PRV), Proportional pressure control valves V Spool, Pressure reducing valves with emphasis on Analog and Digital electronics theory and practice. Introduced to European ISO standards and ANSI Parker system, USA



**With Trainer Mr. Heiner Fitschen, Bosch Rexroth, Germany**



**With colleague and participant Jan Mlechi from Sweden**

Latest component technology in Automation field with handling, operating behavior and setting with test possibilities. Included practical test set-up according to circuit diagrams and information on sources of interference, troubleshooting and commissioning.

Introduction to servo technology with electronic controls.

Following practical exercises with complex troubleshooting tasks were successfully accomplished:

- 1) Call-up command values and assignment of the command value to the solenoid currents and of the ramps to the piston velocities and running times.
- 2) Check the influence of polarity and command value change on a differential cylinder and hydraulic motor.
- 3) Effect of command value on the velocity, switching (limit switch sensor) from rapid motion to creep motion, various ramp times on analog cards for acceleration and deceleration of an actuator through manual and automatic mode.
- 4) Valve control of proportional valves by means of digital amplifier card type VRPD-2X and BODAC (Software operating panel for Digital axis controller).
- 5) Press circuit with proximity switch and pressure switch and processing motor.
- 6) Step settings of digital amplifier card.

### **CONCLUDING REMARKS**

Lot of new knowledge was explored and I got to understand on how Bosch Rexroth plays a leading role in Industrial Automation. This will further strengthen all who undergo training, making Centre of Excellence Bosch Labs platform of practical world-class training. It is deemed fit with the MPSTME's objective to produce a workforce that are high in quality and professionalism.

The soft and functional skills valuable experience knowledge gained were not only acquired through the direct involvement in challenging and complex tasks given but also through other aspect of the training such as work observation, interaction with the staffs.

It has served the purpose of gaining the domain knowledge for up gradation of our Centre of Excellence to be one of the best in India.

I would like to express my deep sense of gratitude and appreciation to our Dean Sir, Dr. N. T. Rao for constant guidance, inspiration and encouragement.

Finally I would like to thank Vice-chancellor Dr. Rajan Saxena, Pro-Vice-chancellor Dr. Sharad Mhaikar and SVKM's management for extending constant support and blessings.

