



VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE
MECHANICAL ENGINEERING DEPARTMENT



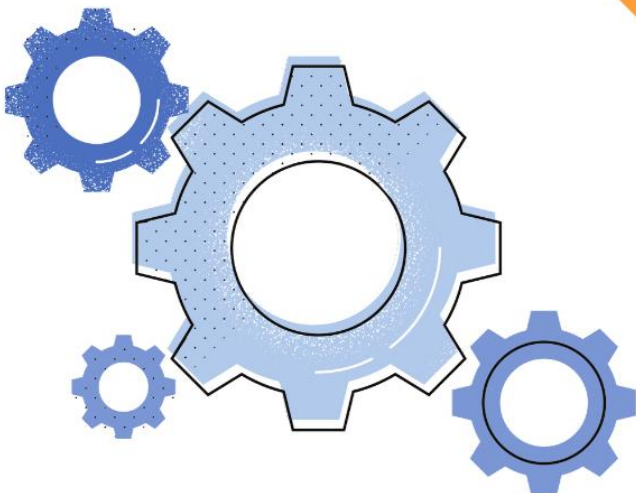
Departmental Newsletter



Volume 1 | Issue 3



Apr-Jun 2026





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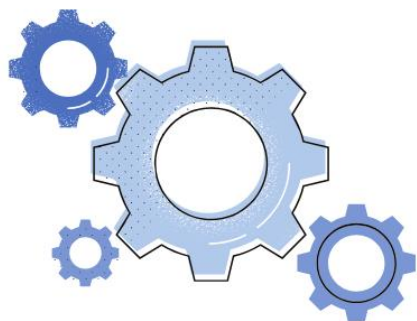
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TECHNICAL NOTE



Editors

- ☐ Dr. Nishit Bedi
- ☐ Dr. Prasanna. P. Raut



On behalf of Mechanical Engineering Department, its my pleasure to present the third issue of departmental newsletter. Many positive happenings in the past three months can be observed in this bulletin. Various sections such as research initiatives, interactions with outer world during the second quarter of 2026 and recap of academic year help this issue to hold its uniqueness. Enthusiasm and dedication of our students in terms of their placements also be noticed.

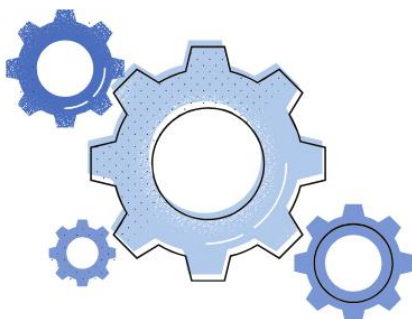


I am happy to share many enriching experiences on academic as well as research front taken at ground level by the department. A meeting of Board of Studies before commencement of upcoming semester will surely help in maintaining the quality of academics delivered at VJTI. I also congratulate Dr. Barve on successful completion of his PhD defense. Other significant activities such as glimpses of industrial visits for practical exposure, summary of placements along with quality improvement in our faculty strength have also marked their appearances.

Newsletter serves not only as a record of accomplishments but also as a testament to the collaborative spirit and commitment to excellence. I extend my sincere appreciation to everyone who contributed to this edition and look forward to many more successful milestones in the journey ahead.

Enjoy reading !!

Dr. Sachin S. Naik





Indian Patent – Gyroscopic Principle Verification Apparatus

Faculty Name: **Dr. Sachin Naik**

Patent Serial Number 231401 Design Number 492529-001

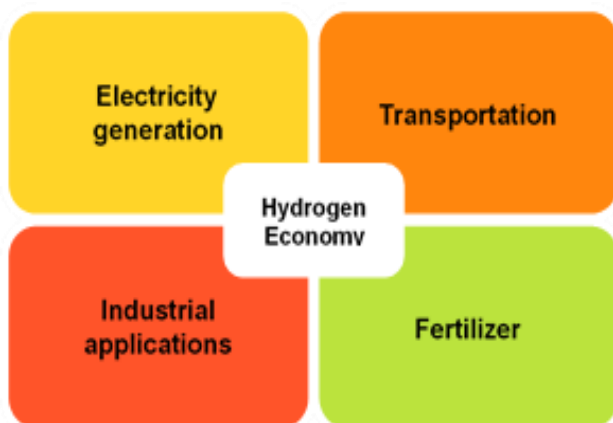
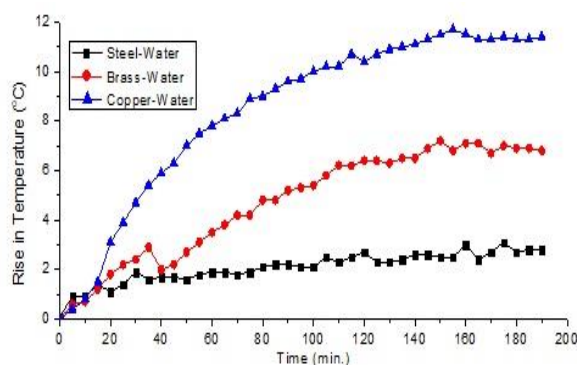
The apparatus involved testing two primary behaviors i.e. resistance to changes in the axis of rotation (rigidity) and the perpendicular reaction to an applied torque known as precision.

Experimental Study of Backward Conduction under Transient Conditions

[10.1007/s10973-026-15480-w](https://doi.org/10.1007/s10973-026-15480-w)

Faculty Name: **Dr. Nishit Bedi**

Flow in microchannels is usually laminar. Under very low flow rates, scaling effect of backward conduction becomes significant. The paper discussed behavior of conjugate phenomenon under transient conditions. Such studies will be useful in designing microsystems during start-up, shutdown as well as change in operating conditions.

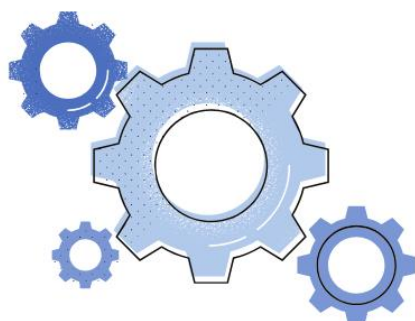


A Review on Hydrogen Production by using Hybrid Renewable System Design

HE-D-26-09405 (accepted for Publication)

Faculty Name: **Ms. Pushpa Patil**

The ways of producing green hydrogen by renewable PV-wind hybrid system was presented in the study. Accordingly, discussion on energy generation potential of both solar PV modules and wind turbines under varying environmental conditions.





International Conference Publication

International Conference on Advances on Clean Energy Research
(ICACER 2026) Porto Portugal April 10-12, 2026

Faculty – **Dr. N P Gulhane**
Student – **Avinash Rathod**

The presented paper discussed various strategies about Material innovations as well as strategies for enhancing thermal efficiency in order to achieve environment friendly results. He obtained **best presentation award in the same category.**

PhD Final Defence

Development and Investigation of Asbestos and Copper Free Phenolic Resin Based Novel Friction Material for Automotive Disc Brake using agro waste SCBA And RH

Faculty Name: **Dr Sachin Barve**
Supervisor Name – **Dr. H P Khairnar**

Agricultural waste such as sugarcane and rice husk was used to develop the friction material. The material can be used in automotive disk brake requirement.



Pre PhD synopsis

An Experimental and Numerical Investigation of Heat Transfer Augmentation under Impingement of Pulsed Jets

Student Name – **Avinash Rathod**
Supervisor Name – **Dr. N P Gulhane**

A comprehensive analysis identified critical operating parameters defined by Reynolds number, Strouhal number, and nozzle-to-target spacing that were used to maximize thermal efficiency in high-heat-flux applications.

Administrative Responsibilities in the year 2026



Dr. A.V. Deshpande, Associate Professor, Mechanical Engineering Department became Dean, Academics in Last week of June 2026. Previously, he use to be Associate Dean, Academics and was greatly appreciated by higher authority.



Dr. Sachin Mastud, Associate Professor, Mechanical Engineering Department became Registrar of the institute in last week of June 2026 for the period of two years. He use to be account incharge for the institute last year.



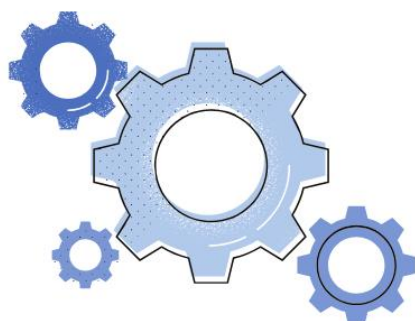
Dr. N.P. Gulhane, Associate Professor, Mechanical Engineering became Dean (Placements, Corporate, Alumni and International Relations) for two year period. He role as training and Placement officer (TPO) was remarkable and was greatly acknowledge by the higher authority.



Dr. V.M. Phalle, Associate Professor, Mechanical Engineering became Dean (Research, Development & Consultancy) for next two years. He has won many awards as researcher and best teacher. His active contribution as Dean (Outreach activities) was appreciated by higher authority.



Dr. H.P. Khairnar, Assistant Professor, Mechanical Engineering Department became Associate Dean (Academics) in Last week of June 2026. Previously, he use to be Examination controller for the degree examinations and was greatly appreciated in that role.



Congratulations...
from
Mechanical Engineering Department



Visiting Professor and Bilateral Talk at Poland

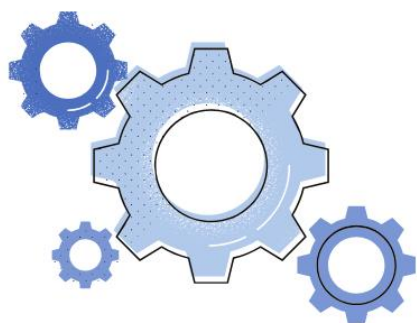


Dr. Gulhane visited Cracow University, Poland during first fortnight of March 2026 as a visiting Professor. Technical discussion with the Professor Dawid Taler and other faculties at Cracow university was observed to fruitful. Various other ways of research collaborations as well as mutual cooperation were also discussed.

During his visit, Dr. Gulhane also delivered a **bilateral Talk with the Embassy of India in Poland** on collaborative research projects, student exchange and internships program between Cracow University of Technology Poland and VJTI Mumbai.

Visiting Researcher at Bilbao Spain

Dr. Gulhane made a research visit to School of Engineering, Bilbao Spain during 2nd week of April 2026. The visit spanned for 20 days and aimed to explore specialized topics of overlapping research interest between Dept. of Energy Eng. University of the Basque Country and VJTI Mumbai for joint publications on disruptive research findings.



Conduct of CET Exam -2026

Dr. Suresh Jadhav, was appointed as Controller CET examination for the Maharashtra state. The Common Entrance Test (CET- 2026) was conducted from last week of March – Second week of May 2026. The institute congratulate him on successful completion of examination under his supervision and wish similar assignments will be completed successfully in future too.

   GOVERNMENT OF MAHARASHTRA STATE COMMON ENTRANCE TEST CELL, MAHARASHTRA STATE, MUMBAI 401, Pinar, New Engineering Building, A-2, Pinar Road, Pinar, Mumbai-400 001 Phone: No. - 822-2204187/932799 Website: www.mahacet.org No Other - 1925XCR, Notice-CET 2026/2025/3416 E-Mail: info@mahacet.org Date - 21/11/2025			
Public Notice STATE COMMON ENTRANCE TEST CELL, MUMBAI Tentative Schedule of CET 2026			
Sr. No.	Department	Name of CET Exam	Tentative Exam Date
1	Higher Education	MAH-MEP-Ed. CET-2026	24-03-2026
2	Higher Education	MAH-MEP-Ed. Field Test (Offline)	25-03-2026
3	Technical Education	MAH-MEP-Ed. CET-2026	25-03-2026
4	Higher Education	MAH-MEP-Ed. (General & Special) & R&D	27-03-2026 to 29-03-2026
5	Technical Education	MAH-MEP-Ed. CET-2026	30-03-2026
6	Higher Education	MAH-MEP-Ed. V.S. CET-2026	01-04-2026 to 02-04-2026
7	Higher Education	MAH-MEP-Ed. CET-2026	04-04-2026
8	Technical Education	MAH-MEP-Ed. Field Test (Offline)	05-04-2026 to 07-04-2026
9	Technical Education	MAH-MEP-Ed. CET-2026	08-04-2026
10	Higher Education	MAH-MEP-Ed. Three Year Integrated Course-CET-2026	09-04-2026
11	Fine Art	MAH-MEP-Ed. CET-2026	10-04-2026
12	Technical Education	MAH-MEP-Ed. PCM Group-2026	11-04-2026 to 13-04-2026
13	Technical Education	MAH-MEP-Ed. PCB Group-2026	21-04-2026 to 23-04-2026
14	Technical Education	MAH-MEP-Ed. BCA/BBA/BMS/BBM CET-2026	28-04-2026 to 30-04-2026
15	Medical Education	MAH-MEP-Ed. CET-2026	05-05-2026
16	Medical Education	MAH-MEP-Ed. CET-2026	06-05-2026 to 07-05-2026
17	Higher Education	MAH-MEP-Ed. (5-Years) CET-2026	08-05-2026

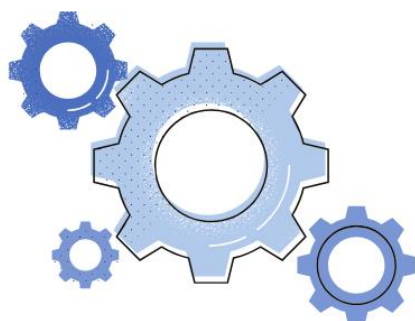
Board of Studies meeting on 21st May 2026



A BoS meeting of the department was held on 21st May 2026. All the four members Dr. Barun Chakraburty, Rt. GM and Head, Corporate Centre for Technical Excellence, L&T Energy Hydrocarbon, Dr. B. E. Narkhede & Dr. Rakesh Raut from IIM Mumbai and Mr Gaurav Bhende from Protton Synergy, Mumbai joined the meeting. The suggestions obtained after detailed discussion from the experts were noted and the syllabus was modified.

Renovation of Heat Engines Lab

SBI Caps funded 2.5 Cr under CSR funding for renovation of heat engines and advance thermal & solar engine lab. In this context, the Boomipoojan was conducted on 25th June, 2026.

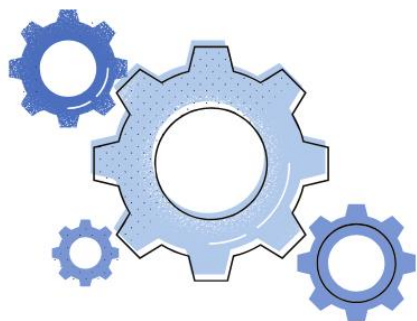




- ❖ This year, students of Mechanical Engg indicated outstanding placement record. Out of total 63 students enrolled for campus placements, 53 were able to secure seats in well known companies. On the other hand, 9 students opted for higher education making a **record placement of 98%** for the year 2026.
- ❖ Many named companies such as **Tata Technologies, Chevron Engineering, Larsen and Toubro, Godrej and many more** shown their interests during campus placements at VJTI and offered lucrative packages. The average and highest CTC for mechanical engineering students placed in companies was observed to be **8.64 lakhs and 17.3 lakhs** respectively.



‘**Turner consultancy and Management services**’ became the center of attraction. The company came for campus drive after a long gap and recruited in total 17 students including 3 from mechanical Engg. A meeting was held with director sir to strengthen Industry – Academia relationship.





Dr. Sachin Naik, Associate Professor, became Head Mechanical Engg Department on 1st Sept 2025. The term is expected to span for 3 years. Dr. Walmik Rathod (Previous HOD) presented various achievements during his tenure and handed over the charge to Dr. Naik. Dr. Naik also presented his plans about navigating the department in order to achieve new heights.

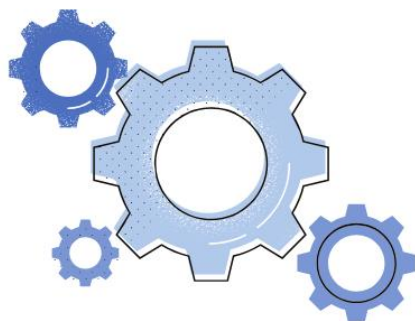


Koradi Thermal Power Plant

In the first fortnight of October 2025, third year B.Tech students visited Tata Hydro Power Plant, Khopoli. The group was accompanied by Dr. A V Deshpande, Dr. Nishit Bedi and Ms. Komal Bedi. A whole day visit presented a detailed insight about the components and layout of the hydro power facility. Various components such as turbines, generators and other related equipment were recognized by students. Real time floor operations were also observed by students. Moreover control facility of the power plant was also explained. A sense of size of equipment used thus a close connect between theory and practical surely helped students to better understand the technical concepts involved in hydro power.

Teaching Excellence Award

Teaching Excellence award for the year 2024-25 was held on the occasion of Teacher's day i.e. 05th September 2025. Dr. Barve and Dr. Tembhare were observed to receive highest percentage of student feedback for M Tech courses. On the other hand, Dr. Tendolkar and Dr. Mitra were observed to receive best feedback in UG courses.



Know Your Faculty

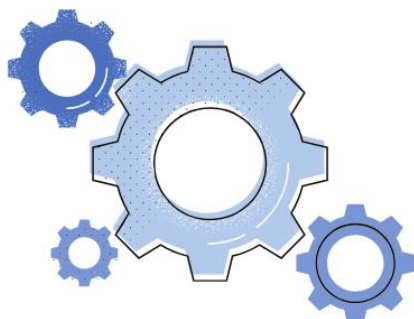
Dr. Avnish Tiwari

Dr. Avnish Tiwari joined the Mechanical Engg Department in Jan 2026. He received his Ph.D from IIT Guwahati and use to be Postdoctoral Fellow at IIT Kanpur. With good involvement in quite diverse areas such as multiphase modelling of additive manufacturing and welding processes, real-time process monitoring, data-driven optimization, computational fluid dynamics, and advanced manufacturing and intelligent production systems he is value addition to the department.



Dr. Prassana Raut

Dr. Prassana Raut joined the Mechanical Engg Department in Jan 2026. He received his Ph.D from VJTI Mumbai. With industrial background, he use to be Production engg in at Luna industries ltd. His practical exposure in variety of fields such as Manufacturing, Strategy Rapid Prototyping and FEA makes him a handy player both in academics and industrial situations. With h-index -5 and i10 index – 6 and total citations of 146 software skills of Dr. Raut are also remarkable making him a quality addition to the department.



Quantum v/s Classical Computing: A Comparative Algorithmic Analysis

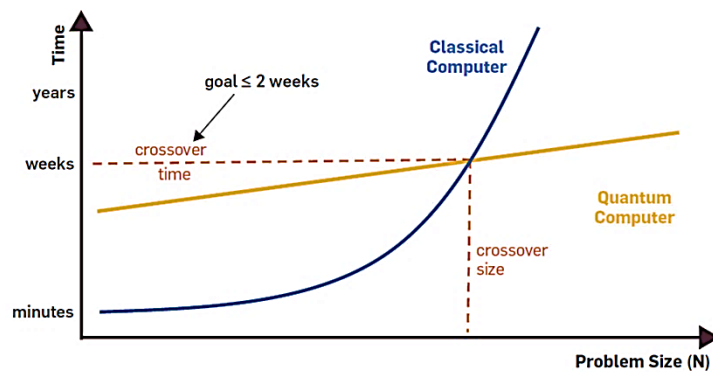
Dr A Rama Rao & Dr S S Naik

1. Introduction & Foundational Paradigms

Computational paradigms define how information is registered, processed, and manipulated to solve physical and mathematical problems. For over three-quarters of a century, Classical Computing has stood as the bedrock of modern digital infrastructure. Grounded in classical physics, it processes information via deterministic mechanisms. Conversely, Quantum Computing represents a fundamental departure from this regime, leveraging the principles of quantum mechanics to process information probabilistically in ways that defy classical intuition.

2. Information Representation: Bits vs. Qubits

The fundamental metric of classical computation is the binary digit, or bit. A classical bit is structurally constrained to occupy one of two mutually exclusive macro-states, represented digitally as 0 or 1. Physically, these states correspond to charge levels in capacitors or voltage thresholds in complementary metal-oxide-semiconductor (CMOS) transistors.



Quantum computing replaces the bit with the quantum bit, or qubit. A qubit is an engineered quantum-mechanical system capable of existing simultaneously in a linear combination of base states. Mathematically, the state of a single qubit is described by a vector in a two-dimensional complex Hilbert space, expressed as:

$$|\psi\rangle = \alpha|0\rangle + \beta|1\rangle \text{ --- (6.1)}$$

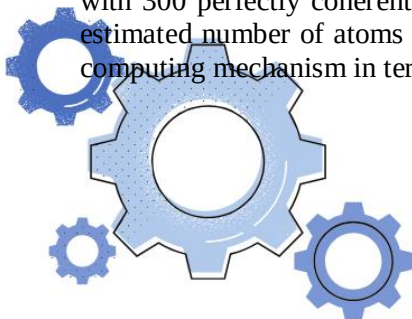
where α and β are complex probability amplitudes subject to the normalization constraint

$$|\alpha|^2 + |\beta|^2 = 1. \text{ --- (6.2)}$$

While a classical register of n bits can store exactly one of 2^n distinct numbers at any given instant, an n -qubit quantum register can maintain a coherent superposition of all 2^n permutations simultaneously.

The Exponential Scaling of Quantum State Space

Every added qubit doubles the dimensionality of the computational state space. A quantum computer with 300 perfectly coherent qubits can simultaneously map 2^{300} states—a number that exceeds the estimated number of atoms in the observable universe. The figure below shows the realm of the two computing mechanism in terms of time and problem size.





3. Core Operational Principles

The unique computational power of quantum systems is driven by three core mechanical properties:

Superposition: The capacity of a system to exist in multiple potential configurations simultaneously until a physical measurement is executed, causing the state vector to collapse into a classical basis state.

Entanglement: A uniquely quantum phenomenon where the state of two or more qubits becomes inextricably linked. The measurement of one qubit instantaneously determines the state of its entangled counterpart, irrespective of spatial separation. This enables highly coordinated parallel information processing across the register.

Quantum Interference: The systematic manipulation of probability amplitudes during the execution of an algorithm. Quantum gates utilize constructive interference to amplify the amplitudes of correct solutions while leveraging destructive interference to cancel out erroneous computational paths.

4. Algorithmic Specialization & Complexity Classes

Quantum computers are not general-purpose accelerative replacements for classical hardware. They are uniquely optimized for specific algorithmic families that exploit structural patterns in problems.

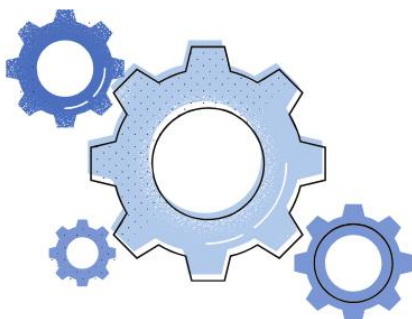
In classical complexity theory, problems are categorized into classes such as P (solvable in polynomial time) and NP (verifiable in polynomial time). Quantum computing introduces the class BQP (Bounded-Error Quantum Polynomial-Time). While quantum computers cannot efficiently solve all NP-complete problems, they offer exponential speedups for problems featuring hidden mathematical periodicities or structural symmetries. Prominent examples include:

Shor's Algorithm: Solves the prime factorization problem in polynomial time ($O((\log n)^3)$), fundamentally threatening asymmetric cryptographic protocols like RSA which rely on classical exponential complexity.

Grover's Algorithm: Offers a quadratic speedup ($O(\sqrt{N})$) for searching unstructured databases, transforming a task requiring N operations classically into one requiring only square-root iterations.

5. Physical Realization Challenges

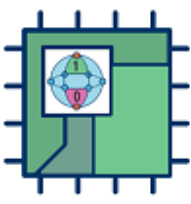
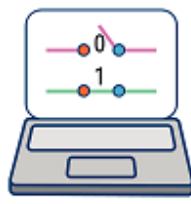
Scaling quantum computers from Noisy Intermediate-Scale Quantum (NISQ) systems to Fault-Tolerant Quantum Computers (FTQC) presents immense engineering bottlenecks. Qubits are highly susceptible to environmental de-coherence, where stray thermal, electromagnetic, or mechanical noise causes the quantum information to decay. To preserve fragile phase relationships, much architecture require dilution refrigerators to maintain operational temperatures colder than deep space, alongside sophisticated error-correcting codes that require thousands of physical qubits to yield a single stable logical qubit. The figure below illustrates the concept of the two methods.

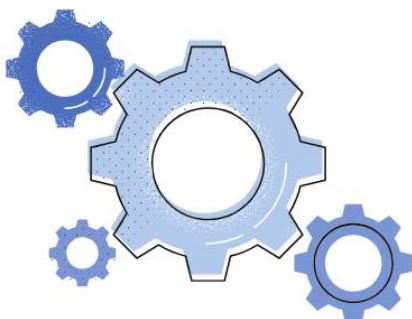




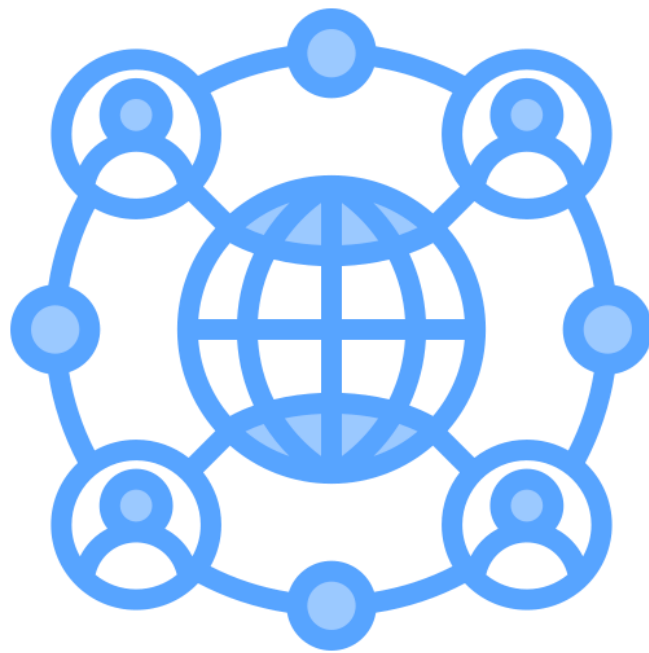
6. Future Outlook & Hybrid Topologies

The consensus within computer science points toward a future characterized by hybrid classical-quantum infrastructures. Quantum Processing Units (QPUs) will act as specialized co-processors integrated into high-performance classical supercomputing clusters. While classical systems will continue to handle traditional tasks, data orchestration, and user interfaces, QPUs will be dynamically invoked to execute specialized algorithms across molecular simulation, financial portfolio optimization, cryptographic key distribution, and dense linear algebra pipelines.

Quantum Computing	Classical Computing
 Calculates with qubits, which can represent 0 and 1 at the same time	 Calculates with transistors, which can represent either 0 or 1
 Power increases exponentially in proportion to the number of qubits	 Power increases in a 1:1 relationship with the number of transistors
 Quantum computers have high error rates and need to be kept ultracold	 Classical computers have low error rates and can operate at room temp
 Well suited for tasks like optimization problems, data analysis, and simulations	 Most everyday processing is best handled by classical computers



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