Kunal Kumar

Tweekerkenstraat 2, Ghent 9000 Belgium • +32 489 06 44 19 • kunal.kumar@ugent.be • linkedin.com/in/kunalk/

SUMMARY

- PhD researcher with a strong background in *operations research* and its applications to *supply chain management*.
- Proficient at formulating linear/nonlinear mathematical models to represent a wide range of complex systems.
- Proven ability to design exact and heuristic algorithms and conduct simulations to facilitate decision making.
- Excellent communication and teamwork skills. Strong intercultural skills gained from working in 4 countries.

PROFESSIONAL EXPERIENCE

Ghent University | Ghent, Belgium **October 2015—Present**

PhD Researcher

Project 1:

- Formulated models for integrated multi-echelon inventory optimization and tactical production planning. Captured the impact of capacity, batch sizes and production smoothing on lead times and safety stocks using queuing theory.
- Conducted quantitative analyses and simulations to generate 'rules-of-thumb' for efficient decision making.
- Designed efficient solution techniques based on dynamic programming and genetic algorithms, implemented in JAVA.
- Demonstrated up to 14% reduction in supply chain costs on real-world supply chain instances.

Project 2:

- Built robust optimization models for integrated order acceptance and production planning under demand uncertainty.
- Developed a two-stage MIP heuristic to beat *Gurobi* in terms of computational times and solution quality.
- Conducted analyses and simulations to derive insights decision making at different levels of risk aversion.

Teaching Assistant

- Designed and taught tutorial sessions for master courses in production management (2015-19) and supply chain management (2015-16) for groups of 80-120 students. Advised students on final projects.
- (Co)supervised 18 master theses on diverse academic and industrial subjects in supply chain management.

National ICT Australia | Melbourne, Australia **February 2015—August 2015**

Visiting Researcher

- Formulated optimization models to support large-scale evacuation planning and scheduling in events of major floods.
- Developed and integrated a Bender's decomposition algorithm into the NICTA evacuation planning software.
- Recommended optimal routes and infrastructure enhancements to state emergency services in New South Wales to increase the potential evacuation rates by 29%.

S3D | Nantes, France **September 2014—January 2015**

Student Consultant

- Developed a mathematical model to optimize supplier selection for a biopower supply chain in Central France to minimize the annual operating costs, including procurement, transportation, inventory, and wastage costs.
- Designed an efficient adaptive large neighbourhood search algorithm to achieve 18% better solutions than *CPLEX*.

Indian Institute of Technology Delhi | Delhi, India **June 2012—May 2013**

Researcher

- Designed an intelligent and proactive system for dynamic job-shop scheduling to reduce lateness penalty by 43%.

Larsen & Toubro | Mumbai, India **December 2010—May 2011**

In-plant Trainee

- Reduced the rejection and rework of an assembly operation due to component misalignment using Six Sigma techniques.
- Improved the sigma level from 2.07 to 3.6 by redesigning broaching fixtures and developing a gauge for quality check.

EDUCATION

PhD in Operations Management/Operations Research **September 2019**

Ghent University, Belgium

Thesis: Production lead times and safety stock placement in supply chains.

Achievement: PhD scholarship worth €200,000.

MSc in Industrial Engineering (Major: Supply Chain Management) **October 2015**

École des Mines de Nantes, France

Grade: 3.76/4.00 (ranked 1st)

Thesis: Convergent evacuation network design.

Achievement: Excellence scholarship worth €5000.

B.Eng. in Production Engineering **October 2012**

Punjab Engineering College, India

Grade: 8.44/10.00

PEER-REVIEWED PUBLICATIONS

1. (2019) Extending the strategic safety stock placement model to consider tactical production planning. In *European Journal of Operational Research*.
2. (2019) On the effect of overtime and subcontracting on supply chain safety stocks. In *Omega – The International Journal of Management Science*.
3. (2018) Effect of setup time reduction on supply chain safety stocks. In *Journal of Manufacturing Systems*.
4. (2018) Integrated lot sizing and safety stock placement in a network of production facilities. In *International Journal of Production Economics*.
5. (2018) Production planning with order acceptance and demand uncertainty. In *Computers & Operations Research*.
6. (2016) Optimizing infrastructure enhancements for evacuation planning. In *30th AAAI Conference on Artificial Intelligence*.
7. (2015) Integrated strategic and tactical optimization of animal-waste sourced biopower supply chains. In *International Conference on Industrial Engineering and Systems Management (IESM)*.

CONFERENCE PRESENTATIONS

1. (2018) Production smoothing and safety stock placement in supply networks. At *EURO2018, Valencia, Spain*.
2. (2017) Optimizing raw materials and finished goods safety stocks in a production network under guaranteed service approach. At *31st ORBEL, Brussels, Belgium*.
3. (2016) Planned lead times, safety stocks, and lot sizing in capacitated production networks. At *OR2016, Hamburg, Germany*.

PATENT APPLICATION

1. Optimizing infrastructure enhancements for evacuation planning. *International Publication No.*: WO 2018/107145.

SKILLS

Languages	English (IELTS: 8/9), French (intermediate), Hindi (native)
Programming	JAVA (advanced), Python, R
Operations Research	CPLEX, Gurobi, GAMS, exact and heuristic techniques.
Simulation	FlexSim, Arena

COMMUNITY PARTICIPATION

- *Led education counselling programs* at The Pebbles (an NGO) as its General Secretory (2009-2013).
- *Counselled students in rural areas* on the STEM career options at Yuvshaala Consultancies (2010-2012).