


# MME 2025

**The 43rd International Conference  
on Mathematical Methods in Economics**

**3-5/9/2025**

## Conference Programme

 Tomas Bata University in Zlín

 Tomas Bata University in Zlín  
Faculty of Applied Informatics

 Tomas Bata University in Zlín  
Faculty of Management and Economics



## Contents

## Welcome to MME 2025

Dear participants,

It is my great pleasure to welcome you to the 43rd International Conference on Mathematical Methods in Economics (MME 2025), hosted by Tomas Bata University in Zlín. Continuing a long tradition, the conference serves as a meeting point for researchers, practitioners, and students interested in operations research, econometrics, optimization, and the wide spectrum of mathematical methods applied to economics and related fields.

MME 2025 offers an inspiring academic program of plenary lectures, parallel sessions, and the PhD student competition. The conference provides a valuable opportunity to share new results, exchange ideas across disciplines, and encourage collaboration between theory and practice. For students and young researchers, it also represents a unique chance to gain feedback, meet experienced colleagues, and strengthen their place within the scientific community.

We believe that the program will stimulate fruitful discussions, spark new collaborations, and contribute to further development of our field. At the same time, we hope you will enjoy the friendly atmosphere and the cultural richness of Zlín.

On behalf of the Organizing Committee,

**Dušan Hrabec**

General Chair of MME 2025

Zlín, September 2025

## Programme

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| <b>Wednesday</b> |   |
|------------------|---|
| 8:30 — 10:00     | Registration of participants (FHS foyer)                    |
| 10:00 — 12:30    | Opening ceremony and Plenary session                        |
| 12:30 — 13:30    | Lunch (FHS foyer)   |
| 13:30 — 15:00    | Parallel sessions A   |
| 15:00 — 15:30    | Coffee break (FHS foyer)                                    |
| 15:30 — 17:00    | Parallel sessions B   |
| 17:00 — 17:30    | Coffee break (FHS foyer)                                    |
| 17:30 — 18:30    | Meeting of the Czech Society for Operations Research (FaME) |
| 18:30 — 21:30    | Welcome evening (FHS foyer)                                 |

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| <b>Thursday</b> |  |
|-----------------|--|
| 9:00 — 10:30    | Parallel sessions C (including PhD students competition and registration of participants)                          |
| 10:30 — 11:00   | Coffee break (FHS foyer)   |
| 11:00 — 12:30   | Parallel sessions D (including PhD student's competition)  |
| 12:30 — 13:30   | Lunch (FHS foyer)  |
| 15:00 — 17:00   | Conference Excursion (Building 21 and Baťa's institutes)   |
| 18:00 — 23:00   | Conference dinner at Baťa's Villa (including the ceremony announcing the results of the PhD student's competition) |

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| <b>Friday</b> |                            |
|---------------|----------------------------|
| 9:00 — 9:30   | Morning coffee (FHS foyer) |
| 9:30 — 11:00  | Parallel sessions E        |
| 11:00 — 11:30 | Closing ceremony           |
| 11:30 — 12:30 | Lunch (FHS foyer)          |

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## Plenary Lectures

### Modeling with Stochastic Programming

*prof. Stein W. Wallace*

There are many deep papers on the mathematics and algorithmics of stochastic programming. But why should we, as operations research people, care? The world is stochastic for sure, but does that imply that we need stochastic models to get good decisions? And if we embark on a genuine application, where real money is involved, what are the modeling questions we need to pose? What are the steps we need to take before we arrive at mathematical and algorithmic challenges?



### Interval Linear Programming and Its Applications

*prof. Milan Hladík*

Interval Linear Programming (LP) provides theoretical foundations and methods for handling LP problems with interval coefficients. While such intervals often represent uncertain input data, we focus on fundamentally different applications. Specifically, we demonstrate how interval LP techniques can be used to address numerical issues in classical real LP, to construct relaxations in global optimization, and to conduct a more comprehensive sensitivity analysis that may involve all coefficients simultaneously.



### Good times with Operations Research. The hunt for practical applications

*Tomáš Pajonk*



## Sessions at FHS Building

### Wednesday

#### Opening & Plenary sessions

10:00 – 12:30, FHS 106 (Aula)

|               |  |
|---------------|--|
| Dušan Hrabec  | Opening talk   |
| Stein Wallace | Modeling with Stochastic Programming                                     |
| Milan Hladík  | Interval Linear Programming and Its Applications                         |
| Tomáš Pajonk  | Good Times With Operations Research. The Hunt for Practical Applications |

#### Parallel sessions A, 13:30 – 15:00

| Room 329   | Session I: Data Envelopment Analysis I   |
|--|--|
| Chair: Martin Flégl                                |  |
| Josef Jablonský                                    | Evaluation and Ranking of Scientific Journals  |
| Ondřej Sokol and Lukáš Frýd                        | Data Envelopment Analysis: How Input Choices Undermine Policy Conclusions  |
| Ebrahim Rezaei, Tomáš Formánek and Josef Jablonský | Threshold Effects with Exogeneity and Endogeneity in Stochastic Frontier Models: An Application for Public Finance |
| Martin Flégl, Kristýna Vltavská and Andres Acero   | Towards Evaluation of the Czech Primary Education and Its Effect on Civic Engagement and Governance                |

| Room 304  | Session II: Decision making with Applications   |
|---|---|
| Chair: Robert Hlavatý   |   |
| Radomír Perzina and Zuzana Neničková                            | An Educational Mobile Tool for Multi-criteria Decision Problems                                   |
| Josef Kunhart, Jiří Pilný, Simona Huguet and Jan Bartoška       | Lyrical Themes in Contemporary Heavy Metal Albums: A Case Study                                   |
| Zuzana Neničková, Lucie Waleczek Zotyková and Radmila Krkošková | Consumer Preferences and Utility in Milk Chocolate Selection: Conjoint Analysis and TOPSIS Method |
| Robert Hlavatý and Helena Brožová                               | On the Efficient Design of a Network Under Multiple Criteria                                      |

| Room 305                        | Session III: Optimization under Uncertainty   |
|---------------------------------|---|
| Chair: Pavel Popela             |   |
| Ondřej Komora and Vít Procházka | A Copula-Based Scenario Generation Method for Discrete Data   |
| Martin Branda                   | Preventive Maintenance in Fixed Interval Scheduling Problems Under Endogenous Uncertainty           |
| Elif Garajová and Miroslav Rada | Convex Enclosures for Interval Linear Programming   |
| Pavel Popela and Lukáš Kokrda   | Solving Engineering Design Problems with Probabilistic and Differential Equations Based Constraints |

| <b>Room 330</b>                | <b>Session IV: Mathematical Economics</b>   |
|--------------------------------|---|
| Chair: Vladimír Holý           |   |
| Michaela Chocholatá            | Modeling CO <sub>2</sub> Emissions and Economic Growth: A Spatial Panel Approach to the N-Shaped EKC            |
| Petra Tomanová                 | The Weak Evidence Effect Revisited: A Mixed-Effects Approach  |
| Dominik Kavřík and Jan Rejthar | Detecting Regime Shifts in the Taylor Curve: A Comparison of Time-Varying Parameter and Markov Switching Models |
| Vladimír Holý                  | Assessing Violations of the Independence of Irrelevant Alternatives in the Plackett-Luce Model                  |

**Parallel sessions B, 15:30 – 17:00**

| <b>Room 329</b>   | <b>Session I : Algorithms and Theory of OR</b>   |
|---|--|
| Chair: Miroslav Rada                                    |  |
| Adam Ulrich, Jan Krňávek and Zuzana Komínková Oplatková | Enhanced Novelty Detection in Economic Big Data Using Half-Space Tree                            |
| Anton Hovana and Peter Trebuňa                          | A Note on Characterization of Comonotonicity   |
| František Koblasa and Miroslav Vavroušek                | Assignment mutation in Evolution Algorithm to improve solutions in Flexible Job Shop Scheduling  |
| Miroslav Rada and Michal Černý                          | How Good Is FGKLA Algorithm on Random Data Coming From Ugly Distributions? A Computational Study |

| <b>Room 304</b>                                 | <b>Session II: Pricing and Energy Markets</b>   |
|---|---|
| Chair: Miloš Kopa                               |   |
| Martin Bařka                                    | Partial Least Squares Structural Equation Modeling in Energy Economics: An Empirical Assessment |
| Martin Bařka, Natálie Várořová and David Hampel | Estimation of Price Elasticity of Demand for Energy in the Czech Republic                       |
| Miloř Kopa                                      | Forecasting of Electricity Prices With Trading Applications                                     |

| <b>Room 305</b>                                  | <b>Session III: Vehicle routing</b>   |
|--|---|
| Chair: Václav Sobotka                            |   |
| Richard Hartl, Duřan Hrabec and Jorge Oyola      | An ALNS Heuristic for Heterogeneous Fleet Routing With Continuity and Compatibility Constraints                                 |
| Lucie řikudová, Duřan Hrabec and Lars M. Hvattum | Quantifying the Value of Stochastic Solution in Routing Problems with Stochastic Demands: A Systematic Review and Meta-Analysis |
| Michal Konopa and Jana Klicnarová                | When Does Reoptimization Pay Off? A Hierarchical Approach to Vehicle Route Planning   |
| Václav Sobotka                                   | Vehicle Routing & Simulations: Revealing Hidden Solution Qualities  |

| <b>Room 330</b>                                 | <b>Session IV: International Economics and Market Structures</b>  |
|---|---|
| Chair: Jana Heckenbergerová                     |   |
| Petra Vašaničová and Martina Košíková           | Cluster Patterns and Coopetition Potential Among EU Countries: An Analysis Based on the Travel and Tourism            |
| Aleš Olejníček, Jakub Odehnal and Jiří Neubauer | Relationship Between Military and Social Expenditures in NATO Countries   |
| Jana Heckenbergerová and Simona Tučková         | Determinants of the Herfindahl-Hirschman Index Affecting Market Power and Concentration in the Czech Insurance Sector |

## Thursday

### Parallel sessions C, 9:00 – 10:30

| <b>Room 329</b>                      | <b>Session I: Data Envelopment Analysis II</b>  |
|--------------------------------------|---|
| Chair: Martin Flégl                  |   |
| Eva Štichhauerová and Miroslav Žižka | Efficiency of Regional Transport Systems  |
| Markéta Matulová and Martin Flégl    | A Dynamic Two-Stage DEA Assessment of Energy Transition   |
| Markéta Matulová and Terézia Vančová | Efficiency of Green Renovation Subsidies in Czech Districts: A robust DEA Approach                                  |
| Martina Kuncová and Roman Fiala      | Efficiency Dynamics in the Czech Brewing Industry: A Post-Pandemic Comparison of Small, Medium, and Large Breweries |

| <b>Room 304</b>              | <b>Session II: Economics &amp; Analysis</b>   |
|------------------------------|---|
| Chair: Diana Bílková         |   |
| Pavel Pražák and Jiří Křenek | On Discrete Dynamical System of New Keynesian Model   |
| Nour Safar                   | General Equilibrium Modeling of Monetary Policy in Resource-Rich Economies: A Systematic Review (2000–2024) |
| Diana Bílková                | Visegrad Four from Crisis to Crisis   |

| <b>Room 305</b>   | <b>Session III: Stochastic Programming &amp; Applications</b>     |
|---|---|
| Chair: František Zapletal                                 |   |
| Vít Procházka   | Scenario Generation for Stochastic Vehicle Routing Problem        |
| Jakub Kašný and Ivan Eryganov                             | Stochastic Bilevel Waste-to-Energy Pricing                        |
| Pavel Popela, Matouš Cabalka, Pavel Charvát and Jan Fišer | Two-Stage Stochastic Program for University Campus EV Charging    |
| František Zapletal  | Stochastic PROMETHEE: Optimal Portfolio Using Mean-Variance Model |



| Room                  | Session IV: PhD students competition I  |
|-----------------------|---|
| Chair: Helena Brožová | 330   |
| Vojtěch Vávra         | Chaotic Optimization with Different Chaos Maps for Tuning XG-Boost: Application to Gas Demand Forecasting   |
| Jakub Neugebauer      | A Vector-Based Weight Adjustment Algorithm for Portfolio Optimization Boosting Genetic Algorithm Efficiency |
| Jan Saro              | Predictive Modelling of Dairy Herd Health Using Markov Chains and Neural Networks                           |
| Qian Gao              | News Sentiment Aware Portfolio Optimization Strategy based on Crisis Regime Switching                       |
| Michaela Sedláková    | Coordination of Expectations: A Case Study in Multi-Asset Markets   |

**Parallel sessions D, 11:00 – 12:30**

| Room 329            | Session I: DEA: Discussion Table |
|---------------------|----------------------------------|
| Chair: Martin Flégl |                                  |

| Room 304                                     | Session II: Portfolio Optimization  |
|--|---|
| Chair: Juraj Pekár                           |   |
| Jialei Xiong, Diana Barro and Martina Nardon | Integrating Market Attention into Portfolio Optimization                                    |
| Adam Borovička                               | Portfolio Selecting Under Vague Preferences   |
| David Neděla, Tomáš Tichý and Gabriele Torri | Entropy-Based Investing Strategies to Hedge Systemic Risk                                   |
| Juraj Pekár, Ivan Brezina and Marian Reiff   | Portfolio Selection in the Return and Absolute Deviation Space Incorporating Esg Indicators |

| Room 305                                     | Session III: Transportation and Route Planning   |
|--|--|
| Chair: Vít Procházka                         |  |
| Jaromír Zahrádka                             | The Solving of Optimal Routes for Multi-Warehouses Distribution by Returning Vehicles          |
| Jindřich Lacko and Michal Černý              | Minimizing Elevation Difference in Route Construction: A Geospatial and Computational Analysis |
| Vít Procházka, Ondrej Komora and Haiying Jia | Optimizing Fleet Deployment under the Contract of Affreightment                                |

| Room 330          | Session IV: PhD students competition II  |
|-------------------|--|
| Chair: Miloš Kopa |  |
| Erik Kočandrle    | Mean-CVaR Portfolio Choice Problem With Endogenous Randomness  |
| Mohamed Atwy      | The Impact of Healthcare Expenditures on Pharmaceutical sales and GDP in the Czech Republic  |
| Anshu Anshu       | The Impact of Social Media on Consumer Behaviour and Its Effect on GDP Growth in India   |
| Petr Krautwurm    | Revisiting the Almost Ideal Demand System with Respect to Substitutability and Complementarity: Suitability for Simulating Consumer Behavior |

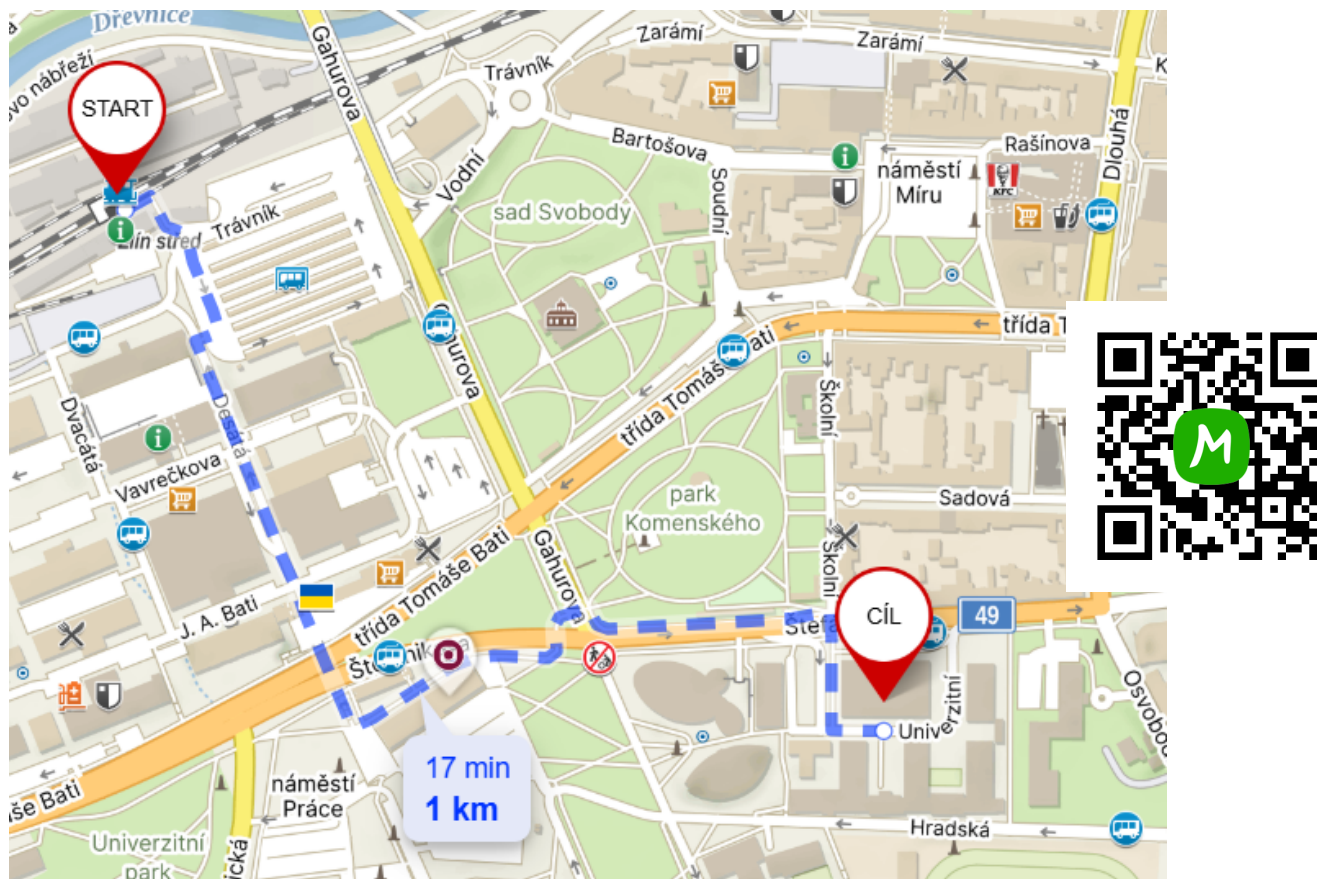
## Friday

### Parallel sessions E, 9:30 – 11:00

| Room 329   |  | Session I: Efficiency Analysis and Production Factors   |
|--|--|---|
| Chair: Jana Hančlová   |  |   |
| Jan Bartoška, Josef Kunhart, Jiří Pilný and Simona Huguet              |  | Extension of the WSJF Method With the Concept of Efficiency for Scrum Team  |
| Simona Huguet, Tomáš Šubrt, Josef Kunhart, Jan Bartoška and Jiří Pilný |  | Transforming Project Management Through Systems Engineering Integration: A Pathway to Enhanced Efficiency and Risk Mitigation |
| Martin Pozdíllek, Alena Pozdílková and Martina Hedvičáková             |  | Modeling Capital-Labor Substitution in the Era of Industry 4.0: A Sectoral Analysis of Czech Manufacturing                    |
| Jana Hančlová and Lucie Chytilová                                      |  | The Share and Intensity of the Digital Transformation Process in EU Countries   |
| Room 304   |  | Session II: Game Theory & Equilibrium Modelling   |
| Chair: Petr Fiala  |  |   |
| Ivan Eryganov  |  | Delta-equilibrium in Price-setting Games  |
| Jan Rejthar  |  | Self-Seeding in Single-Elimination Tournaments  |
| Petr Fiala, Renata Majovská and Lorena Caridad López del Río           |  | New Negotiation Mechanism in Solving Double Auctions  |
| Room 305   |  | Session III: Asset Pricing, Finance and Trading   |
| Chair: Lubor Homolka   |  |   |
| Petr Brzobohatý and Aliaksei Sidoryk                                   |  | ATS As a Modern Tool in Citizen Investing   |
| Bahate Maidiya   |  | The Industry-Level Heterogeneous Impacts of Investor Sentiment on Return, Volume, and Volatility: Evidence From The S&P500    |
| Igor Kohút   |  | Dynamic Stochastic General Equilibrium Model With Heterogeneous Expectations for Small Open Economy                           |
| Room 330   |  | Session IV: Healthcare  |
| Chair: Jaroslav Janáček  |  |   |
| Pavla Jindrová, Hana Boháčová and Dominik Miškář                       |  | Using Multidimensional Comparative Analysis to Assess the Health Risks of the Elderly Population                              |
| Marek Květ and Jaroslav Janeček  |  | Accuracy and Complexity of the Radial Approach to Ambulance Location in Emergency Medical System                              |
| Jaroslav Janáček and Marek Květ  |  | Heterogeneous Region and Its Servicing by Distributed Queuing System  |

## Navigation

The MME 2025 Conference will be held at the Faculty of Humanities (FHS)  
Štefánikova 5670, 760 01, Zlín 1.



Route from the train and bus station to the FHS building



FHS building, conference venue, main entrance

## Social Programme

We have prepared an engaging social programme for all conference participants to explore Zlín's rich industrial heritage and foster networking opportunities. Let's take a closer look at some of the city's most iconic landmarks.

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### Wednesday

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|               |   |
|---------------|---|
| 18:30 — 21:00 | Welcome Evening (Faculty of Humanities) |
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### Thursday

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|---------------|--|
| 15:00 – 17:00 | Conference Excursion (Building 21 and Baťa's institutes) |
| 18:00 – 23:00 | Conference Dinner & Award Ceremony at Baťa's Villa       |

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### Conference Excursion

Conference participants will be divided into two groups (during registration) to visit the iconic landmarks of Zlín's Baťa heritage, both located within walking distance of each other and approximately 10 minutes from the conference venue:

- Group A: Visit to the Building 21 (Baťa's Skyscraper)
- Group B: Guided tour of Baťa Institutes (Buildings 14-15)

After the first round, groups will swap locations to ensure everyone experiences both sites.



Building 21, also known as the Baťa's Skyscraper

One of the highlights of our social programme is a visit to Building 21, also known as the Baťa's Skyscraper, completed in 1938 as the administrative headquarters of the Baťa Shoe Company. A unique feature of this building is the office elevator — a spacious 6 x 6 meter cabin that served as the mobile office of the company's director. Equipped with a sink and air conditioning, this elevator



allowed quick movement between floors. Participants will have the opportunity to experience this remarkable invention and enjoy panoramic views from the 16th-floor observation deck.

Another key destination on the tour is the Baťa Institutes, located in the revitalized Buildings 14 and 15 of the former Baťa industrial complex. These buildings, once a center of industrial production, have been transformed into vibrant cultural and educational spaces. Here, you will visit the Museum of Southeastern Moravia, which provides a captivating insight into the history of the Baťa family and factory. The exhibition shows historical items such as old Baťa shoes, factory machines, and videos about the company's ideas and global impact. Participants can also visit the Regional Gallery of Fine Arts, which displays modern and contemporary art.



Museum of Southeastern Moravia and Baťa Institutes

### **Conference Dinner & Award Ceremony**

Explore the historic Baťa's Villa through an exclusive guided tour with us. 18:00 — 23:00

- Enjoy a delightful conference dinner accompanied by the announcement of the PhD student competition results.
- The evening will be a great opportunity for informal discussions and networking.
- Transportation to Baťa's Villa is individual. You can use Bolt or take bus number 2 from the “Náměstí Práce” stop to the “Čepkov” stop. It is also about a 15-minute walk from the Faculty of Humanities.



Villa of Marie and Tomáš Baťa

## Wi-Fi and Assistance

|               |            |
|---------------|------------|
| Network name: | MME2025    |
| Password:     | conference |

Feel free to contact the organizers below at any time during the conference if you need assistance .

|                    |                  |
|--------------------|------------------|
| Zuzana Vaculčíková | +420 728 691 283 |
| Lubor Homolka      | +420 734 286 175 |



Zuzana Vaculčíková and Lubor Homolka