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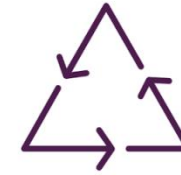
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# «International Conference on Advances in Material Science and Technology - CAMSTech-2020»

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«Intelligent analysis of complex innovative project prospects»

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# Problem statement

*Support decision-making on managing complex innovative projects*

The analysis of the prospects of the complex innovation project to create high-tech mechanical engineering products is based on solving the following **tasks**:

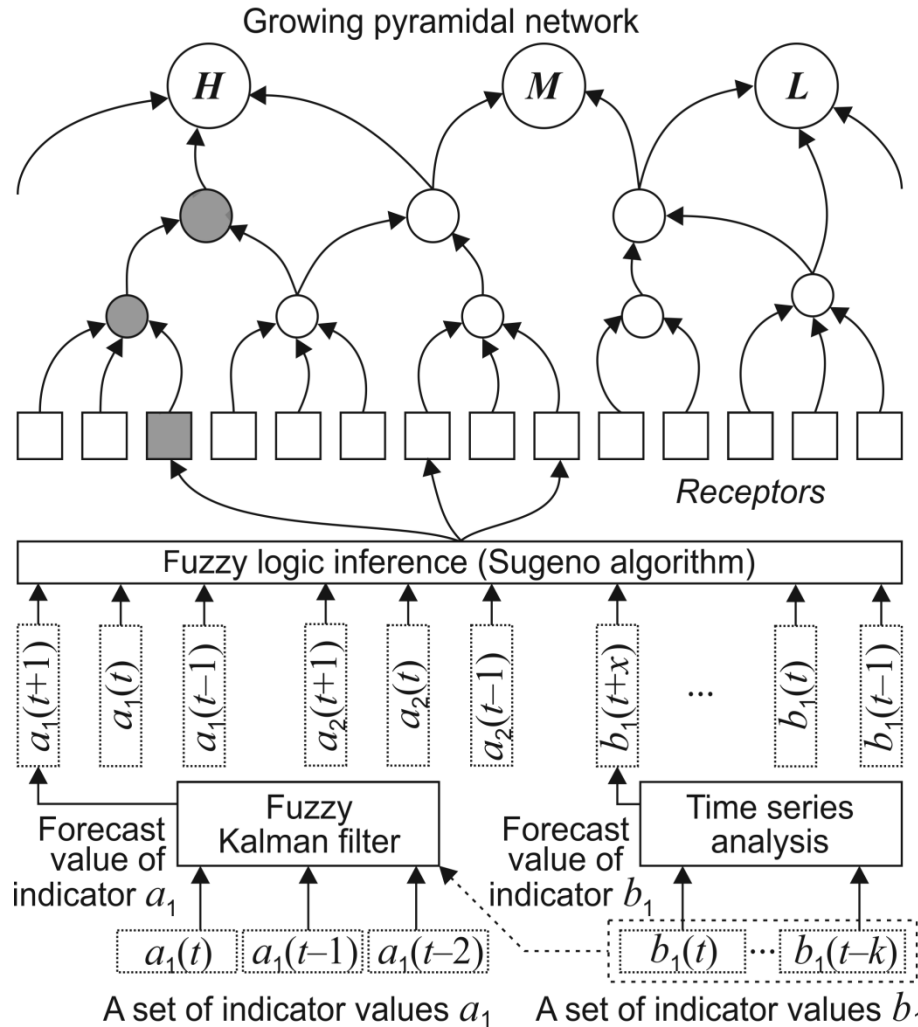
- 1) forecasting the values of initial indicators for assessing the components (investment, material and technical, scientific and industrial, intellectual) of the innovative potential of project participants;
- 2) determining the components of the innovative potential of lower-level taking into account the forecast and retrospective information;
- 3) determining the integral assessment of the innovative potential of project participants;
- 4) developing the final decision on the prospects of the complex innovative project taking into account the possibility of changing the composition of participants.





# Solution methods

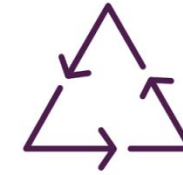
- **task 1:** fuzzy Kalman filter and time series analysis
- **task 2:** Sugeno fuzzy inference
- **tasks 3 and 4:** growing pyramidal networks



**Model for assessing the innovative potential of the project participant**

## Procedure for assessing the prospects of the complex innovation project

1. Forming a set of indicators to assess the innovative potential of project participants and their environment.
2. Forecasting the values of initial indicators to assess the innovation potential using the fuzzy Kalman filter.
3. Forecasting market conjuncture conditions using time series analysis.
4. Determining a joint assessment of the elements of the innovative potential of the project.
5. Diagnostics of the total innovative potential of the complex innovative project using growing pyramidal networks.
6. Making a specific management decision.



# Conclusions

## Results, implementation

### The main research results are as follows:

- a set of indicators for assessing the innovative potential of project participants and their external environment on each project stage;
- the structure of the algorithm for forecasting indicators to assess the components of the participants' innovative potential using two filter circuits (the adjustment of the second circuit is carried out by the Mamdani fuzzy inference);
- the structure of the growing pyramidal network for diagnosing the total innovative potential of several enterprises participating in the complex innovation project;
- the procedure for determining the excited receptors of the growing pyramidal network using the fuzzy-logical inference system according to the Sugeno algorithm;
- the information system that implements the proposed tools for intelligent analysis of prospects of the complex innovation project to create high-tech mechanical engineering products.



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