

<b>Fachbereich:</b>	Structural Engineering
<b>Leiter der Projektarbeit:</b>	Prof. Dr. Michael H. Faber
<b>Betreuer der Projektarbeit:</b>	Jianjun Qin
<b>Titel der Projektarbeit:</b>	Risk based Assessment of Large-span Concrete Bridges
<b>Beschrieb:</b>	<p><b>Problem:</b></p> <p>The risk assessment of large-span concrete bridges in the context of inspection and maintenance planning has become increasingly recognized by engineers as being important. The difficulty is that the performance of such large-scale engineered systems depends on the performance of the individual constituents as well as the way the constituents are interconnected. And it also depends on the probabilistic characteristics of the uncertain events, e.g. concrete corrosion, which may lead to damages of the constituents.</p> <p><b>Aim:</b></p> <p>The aim is the probabilistic analysis of large-span concrete bridges with due consideration of the spatial and temporal variability of the parameters influencing the risk as well as all available knowledge relevant for the performance to provide the basis for the optimal life-cycle decision making for the inspection and maintenance activities.</p> <p><b>Scope:</b></p> <p>The project adapts Bayesian probabilistic networks to the risk assessment of the Farø Bridges in Denmark specifically, which provide the rationale for combining the prior knowledge with the statistical data and give a logistical representation between the variables relevant for risk assessment. The similar data related to the performance of the bridges and the probabilistic models for assessment will be given. Starting point will be the construction of the database to integrate the values of all the parameters influencing the risk as well as the data related to human intervention in terms of monitoring and repair in the past. Meanwhile, the Bayesian networks for risk assessment of the system with condition indicators will be established based on the existing probabilistic models. As soon as the Bayesian networks are available, the assessment of system conditions, e.g. the probabilities of concrete corrosion, can be updated based on the development of interaction between the network and the database, which will be utilized to optimize the decision making finally.</p> <p>The application of the computer tools will be introduced at</p>

the beginning. Completing the present project, students will gain the methodology of risk assessment of large-scale engineered systems.

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**Empfohlene  
Lehrveranstaltungen:**

101-0187-00 G

Risk and Safety in Engineering

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**Besonderes:**

The project is held in English. The group work is possible.