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I declare that I have written the submitted dissertation independently and without unauthorized help, that I have not used any literature other than that cited in it and that I have identified all text passages that have been adopted in whole or in part as well as graphics, tables and AI-generated content used. Furthermore, I declare that digital illustrations only contain the original data or that there is clear documentation of the type and extent of image processing that changes the content.

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Bochum, the

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