

Model Documentation Form

This Form includes all the information to be documented as part of Measure 1.1 of the Transparency Chapter of the Code of Practice. Crosses on the right indicate whether the information documented is intended for the AI Office (AIO), national competent authorities (NCAs) or downstream providers (DPs), namely providers of AI systems who intend to integrate the general-purpose AI model into their AI systems. Whilst information intended for DPs should be made available to them proactively, information intended for the AIO or NCAs is only to be made available following a request from the AIO, either ex officio or based on a request to the AIO from NCAs. Such requests will state the legal basis and purpose of the request and will concern only items from the Form strictly necessary for the AIO to fulfil its tasks under the AI Act at the time of the request, or for NCAs to exercise their supervisory tasks under the AI Act at the time of the request, in particular to assess compliance of high-risk AI systems built on general-purpose AI models where the provider of the system is different from the provider of the model.

Any elements of information from the Model Documentation Form shared with the AIO and NCAs shall be treated in accordance with the confidentiality obligations and trade secret protections set out in Article 78 AI Act.

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Document version number: v1

General information						AIO	NCAs	DPs
Legal name for the model provider:	Nasjonalbiblioteket					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Model name:	borealis-open-4b					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Model authenticity:	We provide a package that proves that Nasjonalbiblioteket has signed the files and that Hellenic Academic and Research Institutions CA have approved that we are indeed Nasjonalbiblioteket. Verification can be done following https://ai.nb.no/verify . d461dd8bff15cab72c74c18d0e9ab85a6de60766424be9d1aaf4d5cab0b5a03b model.safetensors					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Release date:	<input type="text" value="01/06/2026"/>	Date when the model was first released through any distribution channel.				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Union market release date:	<input type="text" value="01/06/2026"/>	Date when the model was placed on the Union market.				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Model dependencies:	google/gemma-3-4b-it					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Model properties						AIO	NCAs	DPs
Model architecture:	The borealis-open-4b is a 4b-parameter instruction-tuned model. This model is based on google/gemma-3-4b-it, and fine-tuned on textual instructions only.					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Design specifications of the model:	This model is a supervised fine-tuned adaptation of the Gemma 3 4B decoder-only Transformer architecture, trained on the aurora-sft-open dataset.					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Input modalities:	<input checked="" type="checkbox"/> Text	<input checked="" type="checkbox"/> Images	<input type="checkbox"/> Audio	<input type="checkbox"/> Video	<input type="text" value="If any other please specify:"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>For each selected modality please include maximum input size or write 'N/A' if not defined</i>	Maximum size: 4096 tokens	Maximum size: 896x896 pixels	Maximum size: N/A	Maximum size: N/A	Maximum size: N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Output modalities:	<input checked="" type="checkbox"/> Text	<input type="checkbox"/> Images	<input type="checkbox"/> Audio	<input type="checkbox"/> Video	<input type="text" value="If any other please specify:"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>For each selected modality please include maximum output size or write 'N/A' if not defined</i>	Maximum size: 8192 tokens	Maximum size: N/A	Maximum size: N/A	Maximum size: N/A	Maximum size: N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Total model size:	<input type="text" value="4 Billion"/>					<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>The range within which the total number of parameters falls.</i>	<input type="checkbox"/> 1—500M	<input checked="" type="checkbox"/> 500M—5B	<input type="checkbox"/> 5B—15B	<input type="checkbox"/> 15B—50B	<input type="checkbox"/> 50B—100B	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/> 100B—500B	<input type="checkbox"/> 500B—1T	<input type="checkbox"/> >1T				
Methods of distribution and licenses						AIO	NCAs	DPs
Distribution channels:	The model is available on HuggingFace at https://huggingface.co/NbAiLab/borealis-open-4b					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	The model is available on HuggingFace at https://huggingface.co/NbAiLab/borealis-open-4b					<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
License:	Gemma (https://ai.google.dev/gemma/terms)					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Use		AIO	NCA	DPs
Acceptable Use Policy:	<ul style="list-style-type: none"> - The model may hallucinate or produce incorrect information. - Safety alignment reduces but does not eliminate harmful or inappropriate outputs. - Performance outside Norwegian and English use cases has not been fully characterized. <p>As the model is a derivative of Gemma 3, the same use restrictions apply:</p> <ul style="list-style-type: none"> - Illegal Acts & Violence: Generating content that violates laws, promotes violence, or details how to build weapons. - Severe Personal Harm: Facilitating suicide, self-harm, child exploitation, human trafficking, or cyberattacks. - Malicious Cyber Activities: Writing malware, automating spam, or engineering phishing campaigns. - Hate Speech & Harassment: Generating slurs, organizing targeted bullying, or inciting hatred against protected groups. - Deception & Impersonation: Deploying scams, committing fraud, or misleadingly pretending to be a real person. - Explicit Content: Generating sexually explicit text, pornography, or unauthorized adult chatbots. - Regulated Advice: Providing automated medical, financial, or legal advice without certified oversight. - Critical Decisions: Making automated judgments on high-stakes matters like credit scores, housing, or hiring. 	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Intended uses:	<ul style="list-style-type: none"> - Norwegian-centric assistant-style tasks (e.g., drafting, summarization, Q&A, light reasoning). - Assessment of Norwegian writing style and quality. - Early evaluation of behavior, language coverage (Norwegian / Bokmål / Nynorsk / Sami), and quality. 	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Type and nature of AI systems in which the general-purpose AI model can be integrated:	This model is intended for integration into Norwegian-centric conversational assistants, drafting and summarization tools, question-answering and light reasoning systems, and language quality assessment applications, with a focus on evaluating behavior, writing quality, and language coverage across Norwegian Bokmål, Nynorsk, and Sami in human-supervised workflows.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Technical means for model integration:	The model is available on HuggingFace and it is also available in quantized formats for llama.cpp and ollama and MLX formats for Apple devices.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Required hardware:	GPU VRAM 8-12 GB, System RAM 16 GB	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Required software:	Transformers: https://github.com/huggingface/transformers@v4.49.0-Gemma-3	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Training process		AIO	NCA	DPs
Design specifications of the training process:	The model is a supervised fine-tuned version of the Gemma 3 4B initialized from google/gemma-3-4b-it and trained using full-parameter fine-tuning on Norwegian instruction datasets. Training uses cosine learning rate scheduling (1e-5 initial LR), and a 0.1 warmup ratio over 3 epochs, with sequences up to 4096 tokens.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Decision rationale:	The model is an adaption of Gemma 3 to Norwegian contexts for instruction-following behaviour. SFT seems sufficient for a first release.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Information on the data used for training, testing, and validation		AIO	NCA	DPs
Data type/modality: <i>Select all that apply.</i>	<input checked="" type="checkbox"/> Text <input type="checkbox"/> Images <input type="checkbox"/> Audio <input type="checkbox"/> Video <input type="checkbox"/> If any other please specify:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data provenance: <i>Select all that apply</i>	<input checked="" type="checkbox"/> Web crawling <input type="checkbox"/> Private non-publicly available datasets obtained from third parties <input type="checkbox"/> User data <input type="checkbox"/> Data collected through other means <input checked="" type="checkbox"/> Publicly available datasets <input checked="" type="checkbox"/> Synthetic data that is not publicly accessible (when created directly by or on behalf of the provider) <input type="checkbox"/> If any other please specify:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

For definitions of each listed category, see the Template for the Public Summary of the Training Content of General-Purpose AI models provided by the AI Office

How data was obtained and selected:	The model was trained on NbAiLab/aurora-sft-open. NbAiLab/aurora-sft-open consist of a machine-translated version of English instruction data from allenai/tulu-3-sft-mixture, a curated instruction dataset developed as part of the Mimir project, xsample/tulu-3-mig-50k, a parallel corpus for Bokmål-Nynorsk translation, a dataset containing of single and multi-turn translation conversations constructed between several Sámi languages and Norwegian Bokmål, syntetic data using deepseek-ai/DeepSeek-V3.2.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Number of data points:	The dataset consists of 882 263 documents and 674 704 598 tokens (gemma3 tokenizer).	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	The dataset consists of 882 263 documents and 674 704 598 tokens (gemma3 tokenizer).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scope and main characteristics:	The training, validation, and test data consist of high-quality supervised instruction datasets focused on Norwegian (Bokmål, Nynorsk), Sámi languages, and English. The data covers conversational AI, instruction-following, translation, summarization, and news-related generation tasks such as title and ingress creation. The dataset is split into ~95% training, 2.5% validation, and 2.5% test.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Data curation methodologies:	Strict filtering based on content and structural quality scores using deepseek-ai/DeepSeek-V3.2 to ensure high-quality samples for fine-tuning.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Measures to detect unsuitability of data sources:	The data used for the training consists in its majority of synthetic data automatically assessed by existing frontier LLMs, or humanly supervised machine translations of heavy-filtered existing datasets in English. CSAM filters were also applied to filter out toxic and unsuitable content.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Measures to detect identifiable biases:	We manually verified a subset of translated and synthetically generated samples to inspect biases. We removed biases against model self-identification and political orientation.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Computational resources (during training)		AIO	NCAAs	DPs
Training time:	Less than 1 month	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	0.87 days wall clock time; 6.9 NVIDIA H200 GPU-days (8×0.87 days)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Amount of computation used for training:	10 ¹⁹ FLOPs	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	3.6316 × 10 ¹⁹ FLOPs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Measurement methodology:	We estimated the number of FLOPs per token using the OpenAI scaling law paper. We then multiply that number by the number of tokens trained on.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Energy consumption (during training and inference)		AIO	NCAAs	DPs
Amount of energy used for training:	9.819 × 10 ⁻² MWh	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Measurement methodology:	We train our model with Weights & Biases as logging system, this logs the power usage during training. We take the average power usage and then multiply by the compute time.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Benchmarked amount of computation used for inference¹:	Model runs comfortably on a 12-16 GB VRAM.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Measurement methodology:	Measured using the vLLM inference runtime.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

¹ This item relates to energy consumption during inference, which makes up the “energy consumption of the model” (Annex XI, 2(e), AI Act) together with energy consumption during training. Since energy consumption during inference depends on more than just the model itself, the information required for this item is limited to relevant information depending only on the model, namely computational resources used for inference.