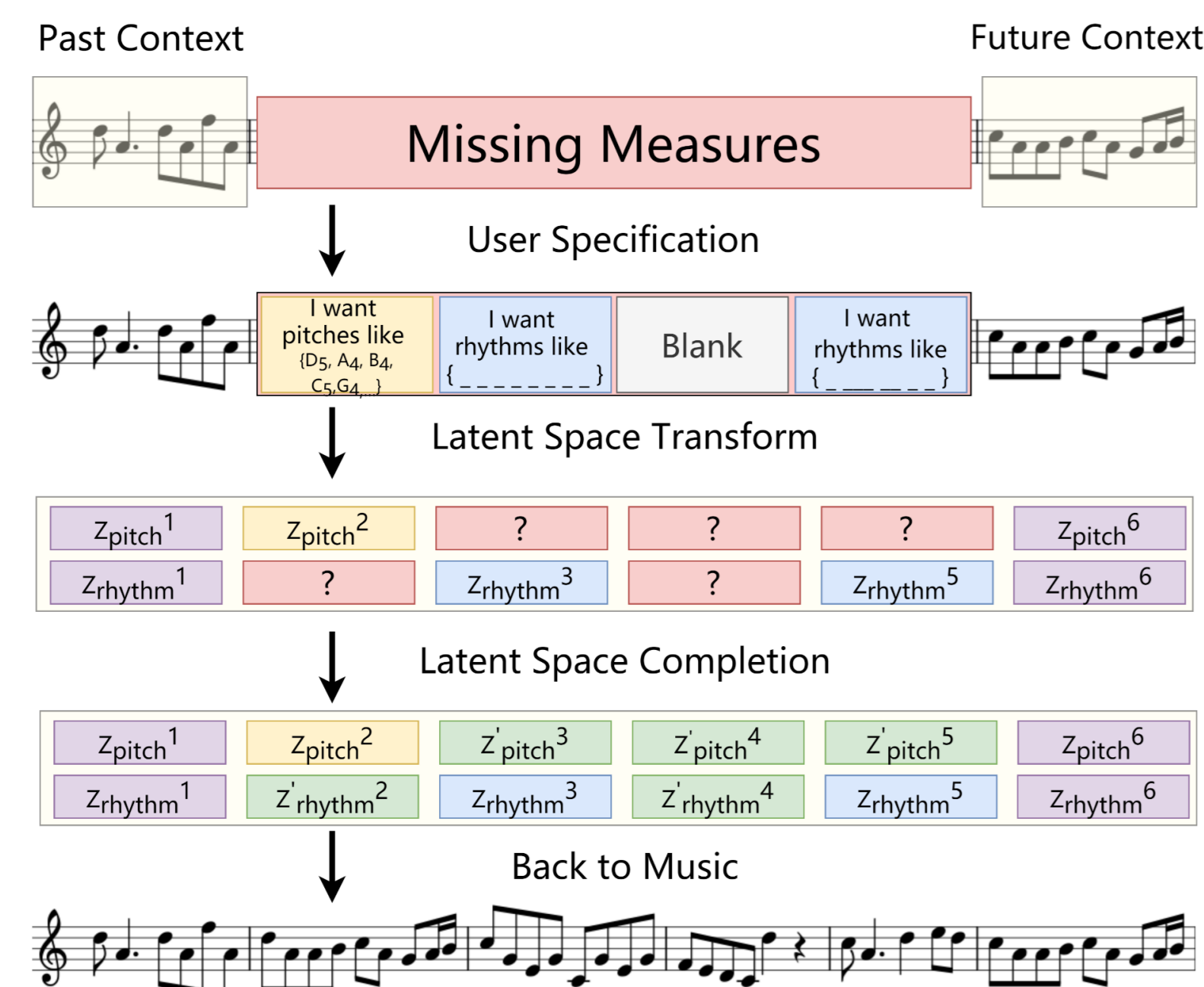




Code Repo

What is Music SketchNet ?

The Music SketchNet is a model that allows users to specify partial music ideas, namely rhythm and pitch contour, in the process of music composition.



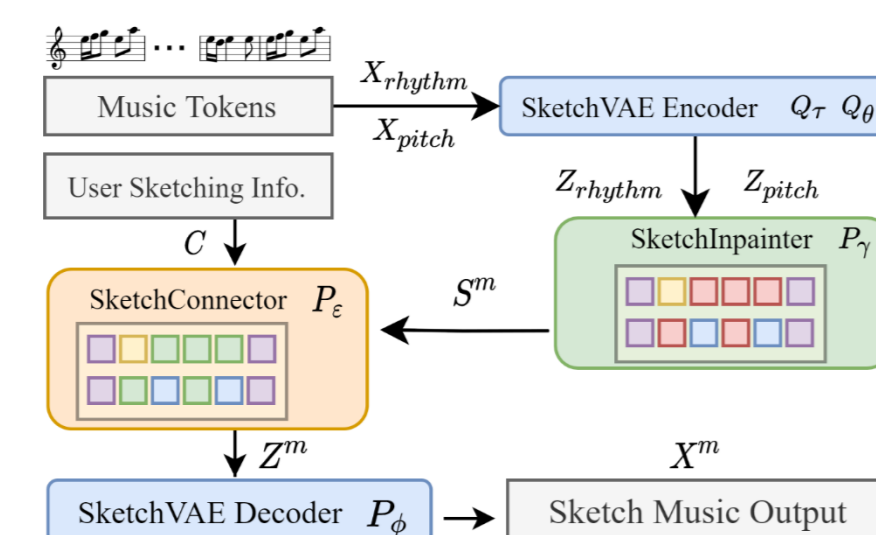
The Music SketchNet is constructed in a context completion scenario:

- Given past and future contexts, it allows to generate the missing middle measures.
- Users can specify rhythm and pitch contour in the missing measures.
- The model will try to meet the user's specifications in the generation in specific musical style.

The Pipeline and Components

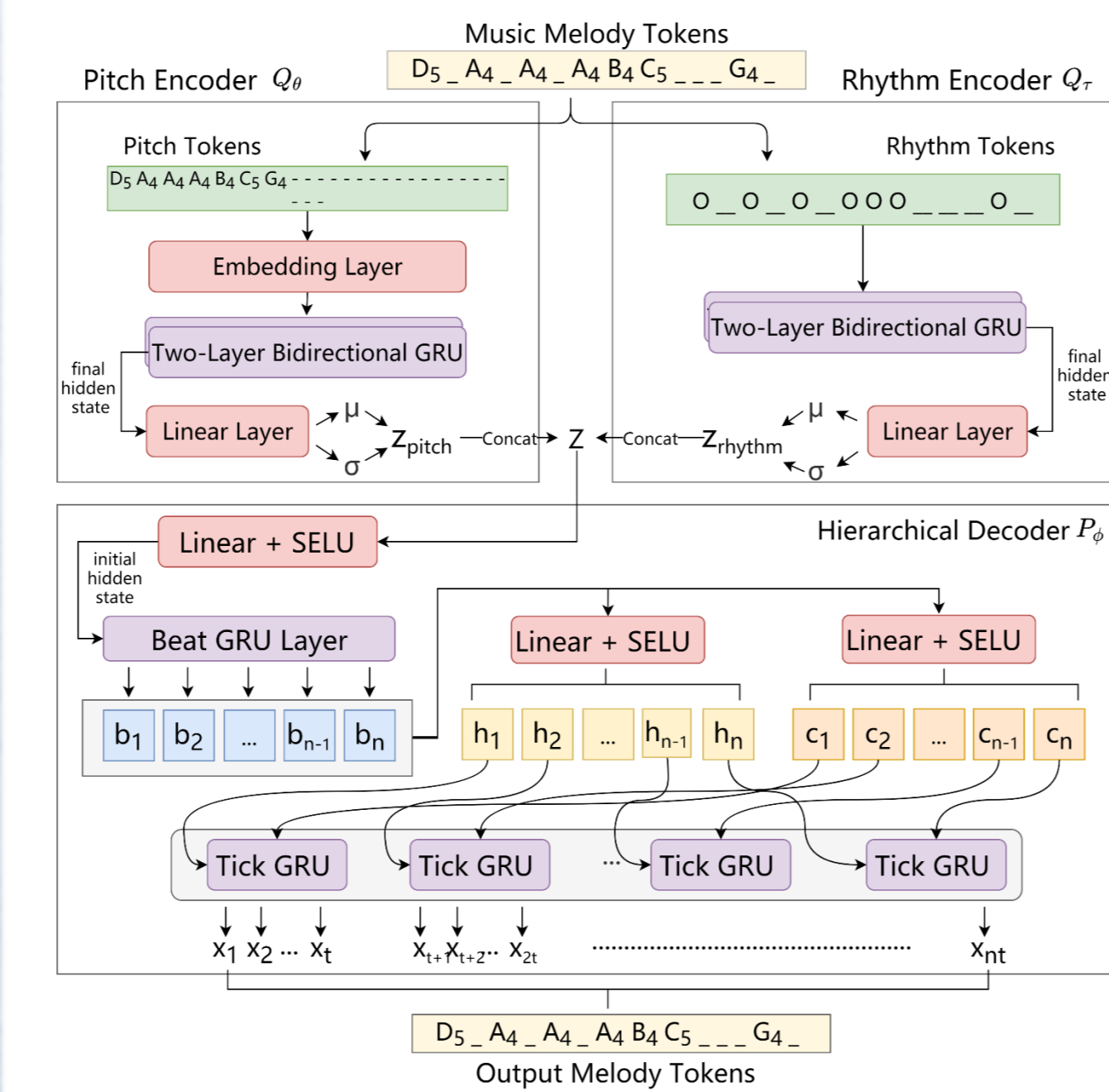
The Music SketchNet has :

- The SketchVAE
- The SketchInpainter
- The SketchConnector



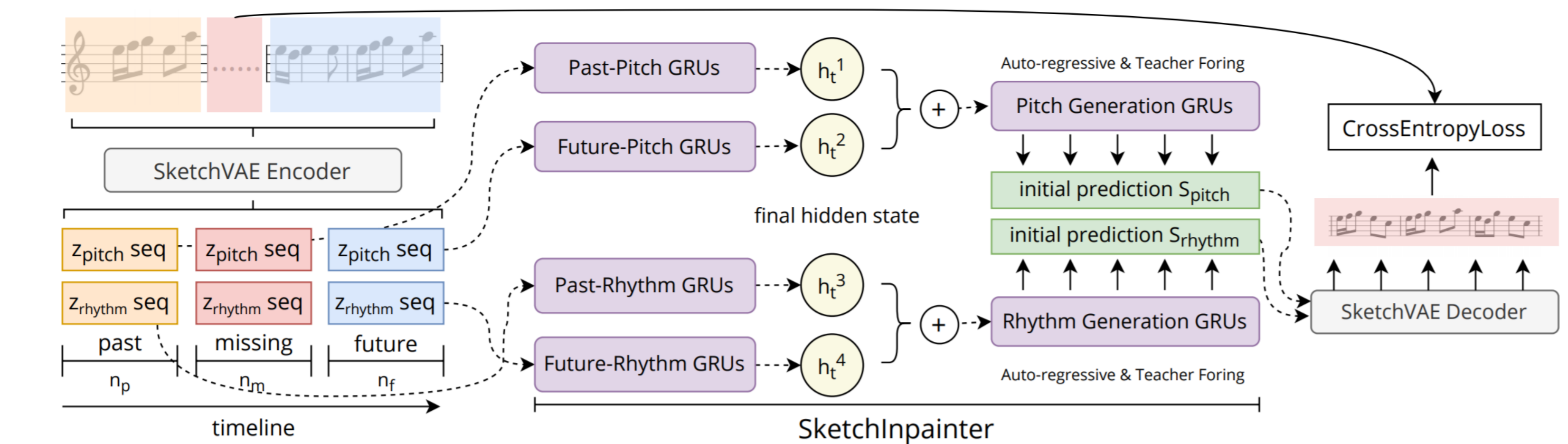
I. SketchVAE

Convert a single measure to a latent code with the disentangled pitch part and the rhythm part.



II. SketchInpainter

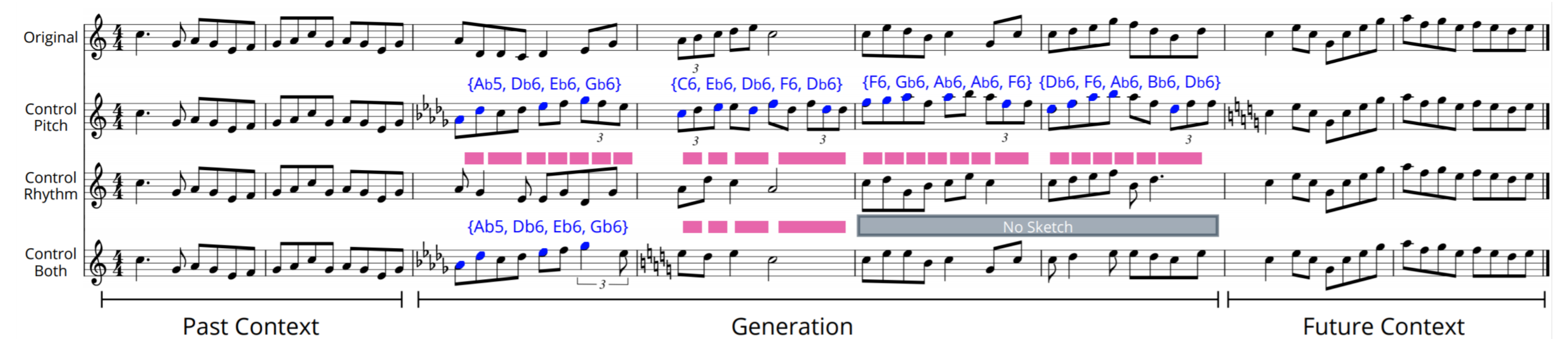
Predict the missing middle measures based on the previous and future contexts in the latent space. Separate the prediction process: rhythm -> rhythm; and pitch -> pitch.



Generation Demos

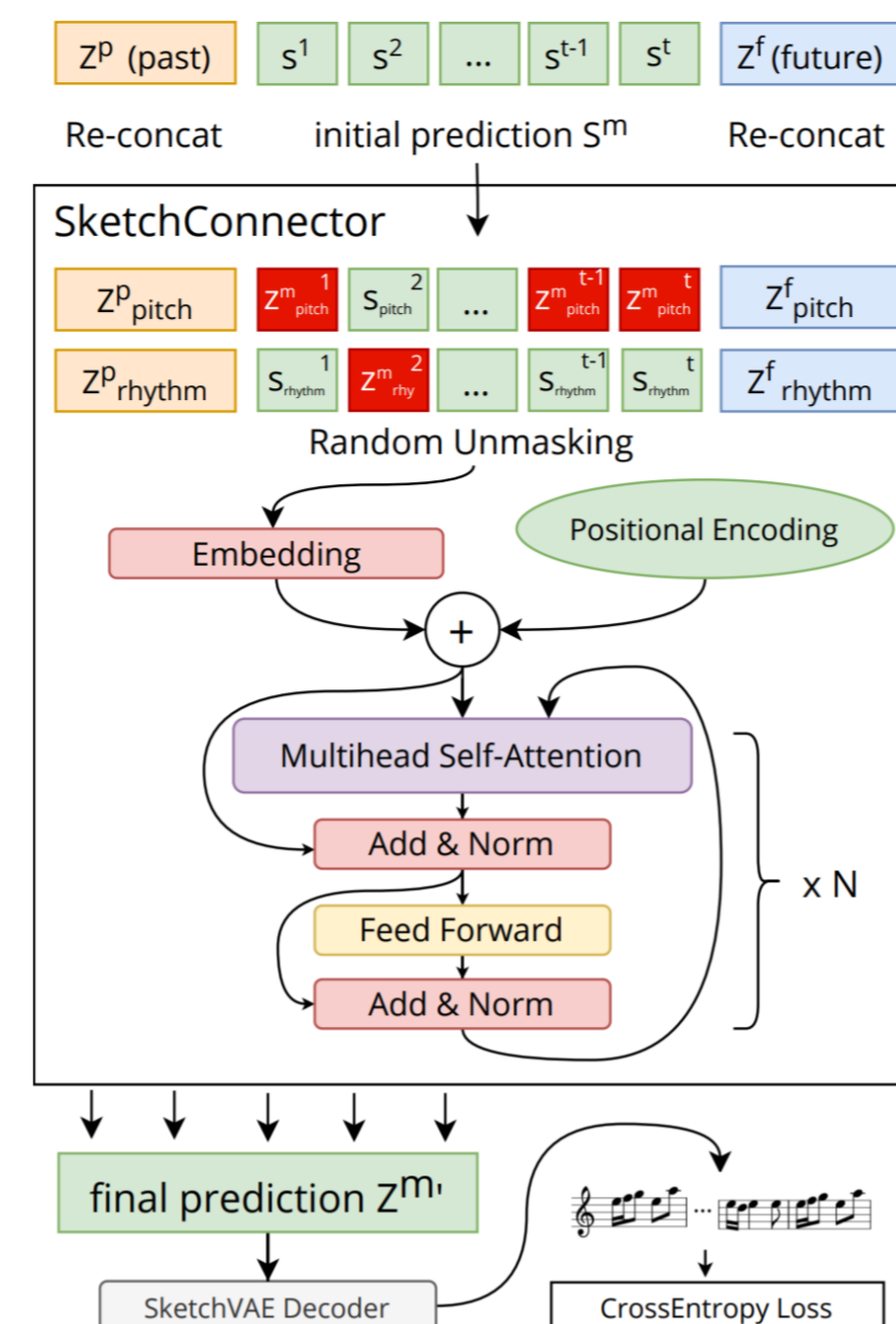
- Original folk song.
- Generation with specifications in pitch contour.
- Generation with specifications in rhythm pattern.
- Generation with both specifications.

Access poster's demos in "Paper Demo" Folder with the QR code



III. SketchConnector

Finalize the generation from the SketchInpainter. Simulate the user controls by random unmasking.



Experiments

- The reconstruction performance comparison among existing models in three test sets.

Model	Irish-Test			Irish-Test-R			Irish-Test-NR		
	loss ↓	pAcc ↑	rAcc ↑	loss ↓	pAcc ↑	rAcc ↑	loss ↓	pAcc ↑	rAcc ↑
Music InpaintNet	0.662	0.511	0.972	0.312	0.636	0.975	0.997	0.354	0.959
SketchVAE + InpaintRNN	0.714	0.510	0.975	0.473	0.619	0.981	1.075	0.374	0.964
SketchVAE + SketchInpainter	0.693	0.552	0.985	0.295	0.692	0.991	1.002	0.389	0.977
SketchNet	0.516	0.651	0.985	0.206	0.799	0.991	0.783	0.461	0.977

- The subjective listening test with three criteria.

Model	Complexity↑	Structure↑	Musicality↑
Original	3.22	3.47	3.56
InpaintNet	2.98	3.01	3.09
SketchNet	3.04	3.29	3.26

- Virtual control test (details in paper)

Control Info.	Rhythm	Pitch
Pitch Acc.	0.189	0.881
Rhythm Acc.	0.973	0.848

Conclusion

- A new model for controllable music generation.
- Three components for different tasks in the generation pipeline.
- Both objective and subjective experiments in evaluating generations.
- Broader potential applications with music latent variables.