## Electronic Supplementary Information to the paper "Cross-sectional shape evolution of GaN nanowires during molecular beam epitaxy growth on Si(111)"

### Digital processing and analysis of STEM images

We processed and analyzed STEM images of GaN nanowires using the free software ImageJ (ImageJ 1.50b, https://imagej.net) with several plugins as mentioned below. Here we describe the main steps of the digital processing of the STEM images for the example of Fig. 2c in the main text of the paper.
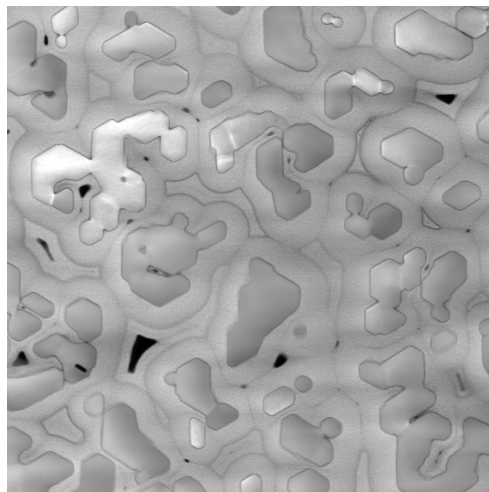
Initial cross-sectional images of nanowires are obtained with a relatively low magnification and a high resolution of $4096 \times 4096$ pixel$^2$:
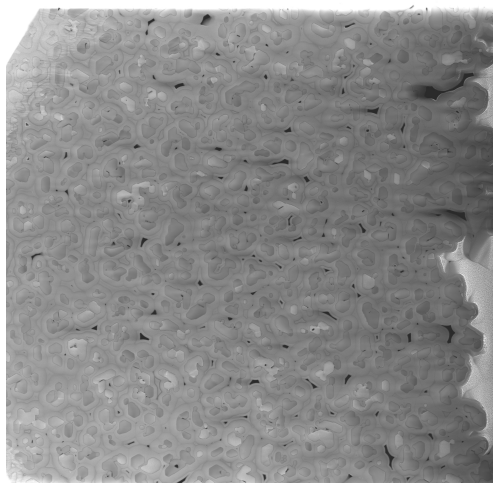


We demonstrate the digital processing procedure on a small magnified part of the image:
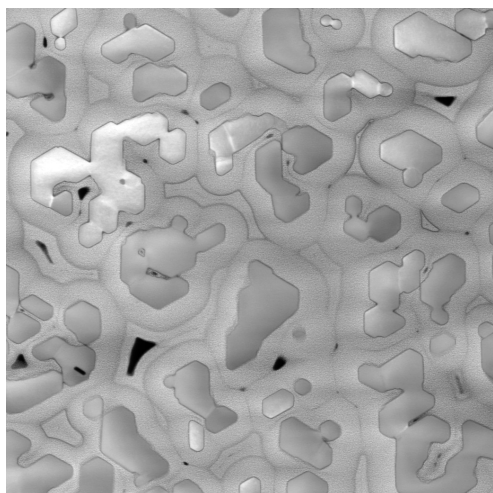


Reduce noise using the median filter with $3 \times 3$ pixel$^2$ kernel:



Highlight edges of nanowires using the **Variance** filter. It replaces each pixel with the neighborhood variance. The size of neighborhood regions, where variance values were calculated, is specified in the **Radius** option and taken to be 3 pixels.
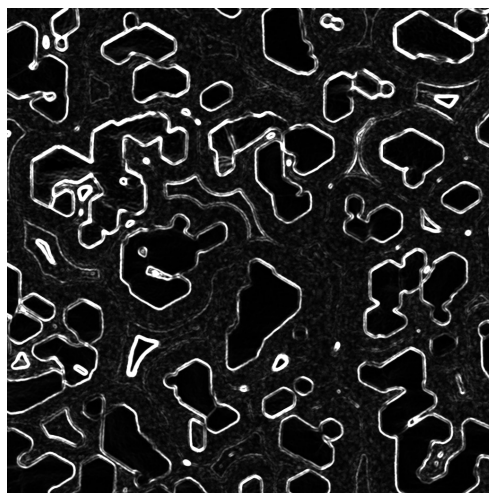
Select each nanowire using the **Wand (tracing) tool** with a tolerance parameter of about 30. For nanowires with blurred edges, this parameter is appropriately modified in the interval 20 to 40. The selected regions corresponding to nanowires are filled white, while the outside areas are filled black:
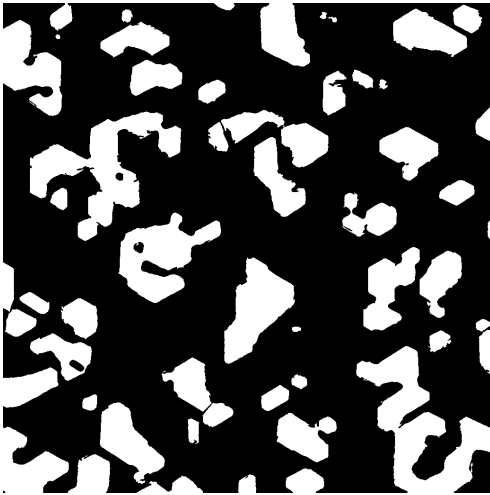


Finally, manually correct obvious segmentation errors using **Freehand selection** tool (few corrections are marked by arrows):
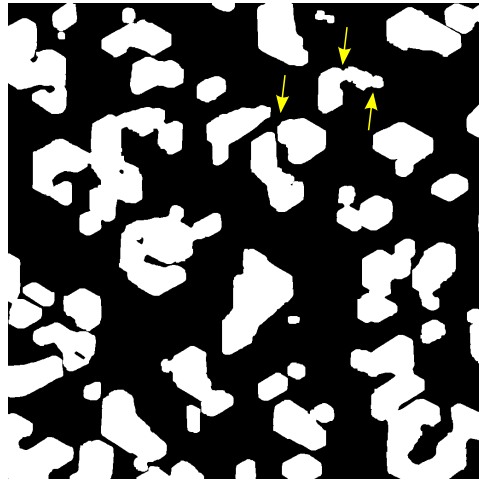


Apply **Variance** filter with **Radius** set to 3 pixels (step equal to 3). It results in a shift of the nanowire edges inwards. So, apply **Dilate** operation three times to restore the edges to their true positions: