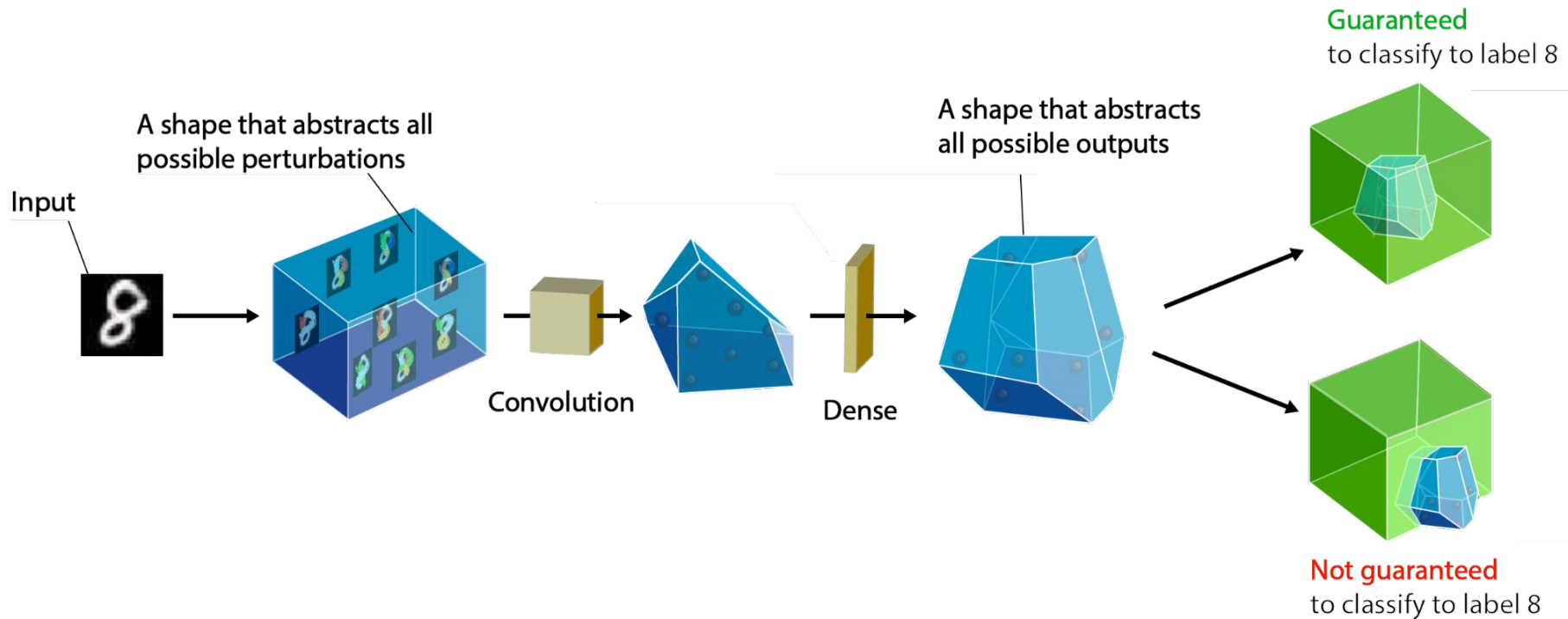


Implementacija rada: “An Abstract Domain for Certifying Neural Networks”

Slobodan Jenko
Matematički fakultet Univerziteta u Beogradu
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Uvod

Apstraktna interpretacija za neuronske mreže



DeepPoly

$$\langle x_1 \geq -1, \\ x_1 \leq 1, \\ l_1 = -1, \\ u_1 = 1 \rangle$$

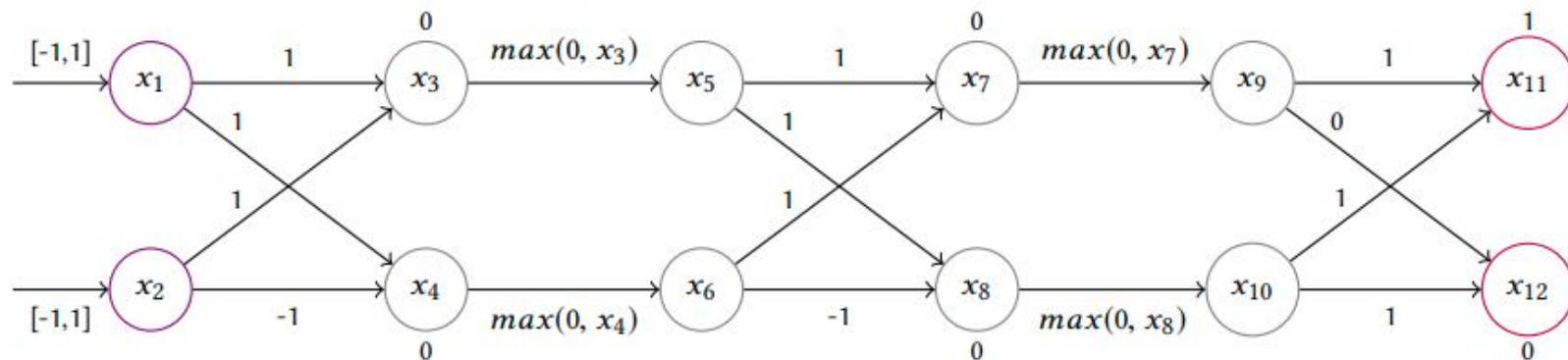
$$\langle x_3 \geq x_1 + x_2, \\ x_3 \leq x_1 + x_2, \\ l_3 = -2, \\ u_3 = 2 \rangle$$

$$\langle x_5 \geq 0, \\ x_5 \leq 0.5 \cdot x_3 + 1, \\ l_5 = 0, \\ u_5 = 2 \rangle$$

$$\langle x_7 \geq x_5 + x_6, \\ x_7 \leq x_5 + x_6, \\ l_7 = 0, \\ u_7 = 3 \rangle$$

$$\langle x_9 \geq x_7, \\ x_9 \leq x_7, \\ l_9 = 0, \\ u_9 = 3 \rangle$$

$$\langle x_{11} \geq x_9 + x_{10} + 1, \\ x_{11} \leq x_9 + x_{10} + 1, \\ l_{11} = 1, \\ u_{11} = 5.5 \rangle$$



$$\langle x_2 \geq -1, \\ x_2 \leq 1, \\ l_2 = -1, \\ u_2 = 1 \rangle$$

$$\langle x_4 \geq x_1 - x_2, \\ x_4 \leq x_1 - x_2, \\ l_4 = -2, \\ u_4 = 2 \rangle$$

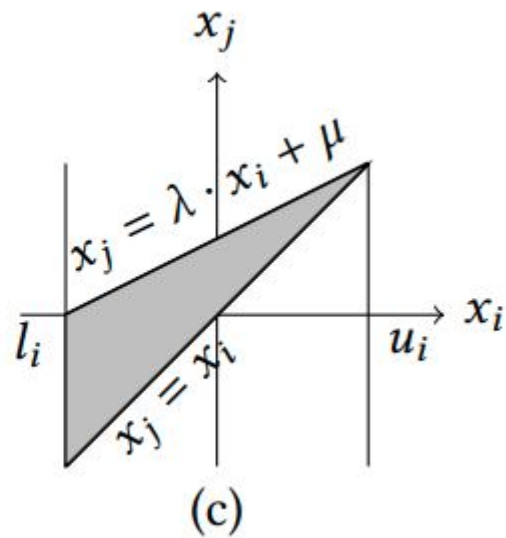
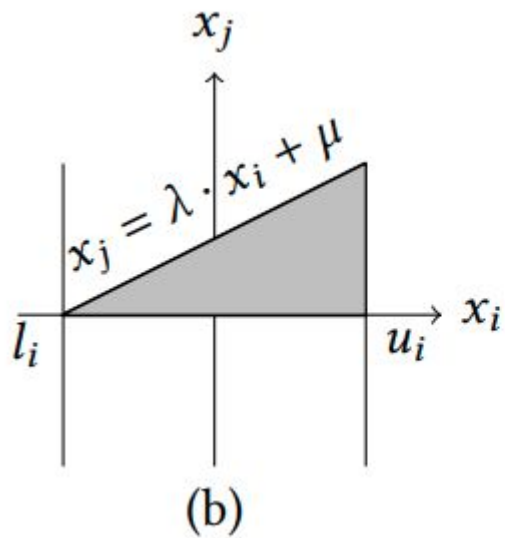
$$\langle x_6 \geq 0, \\ x_6 \leq 0.5 \cdot x_4 + 1, \\ l_6 = 0, \\ u_6 = 2 \rangle$$

$$\langle x_8 \geq x_5 - x_6, \\ x_8 \leq x_5 - x_6, \\ l_8 = -2, \\ u_8 = 2 \rangle$$

$$\langle x_{10} \geq 0, \\ x_{10} \leq 0.5 \cdot x_8 + 1, \\ l_{10} = 0, \\ u_{10} = 2 \rangle$$

$$\langle x_{12} \geq x_{10}, \\ x_{11} \leq x_{10}, \\ l_{12} = 0, \\ u_{12} = 2 \rangle$$

ReLu



Implementacija

Testovi

