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(54) Title (EN): VERIFICATION OF PERCEPTION SYSTEMS

(54) Title (FR): VÉRIFICATION DE SYSTÈMES DE PERCEPTION

(57) Abstract:
(EN): There is provided a computer-implemented method for verifying the robustness of a neural network classifier with respect to one or more parameterised transformations applied to an input, the classifier comprising one or more convolutional layers, the method comprising: encoding each layer of the classifier as one or more algebraic classifier constraints; encoding each transformation as one or more algebraic transformation constraints; encoding a change in an output classifier label from the classifier as an algebraic output constraint; determining whether a solution exists which satisfies the classifier constraints, transformation constraints and output constraints, and determining the classifier as robust to the local transformations if no such solution exists. A perception system and a computer readable medium are also provided.

(FR): L'invention concerne un procédé mis en œuvre par ordinateur pour vérifier la robustesse d'un classificateur de réseau neuronal par rapport à une ou plusieurs transformations paramétrées appliquées à une entrée, le classificateur comprenant une ou plusieurs couches de convolution, le procédé consistant : à coder chaque couche du classificateur sous la forme d'une ou de plusieurs contraintes de classificateur algébriques ; à coder chaque transformation sous la forme d'une ou de plusieurs contraintes de transformation algébriques ; à coder un changement dans une étiquette de classificateur de sortie à partir du classificateur sous la forme d'une contrainte de sortie algébrique ; à déterminer si une solution existe qui satisfait les contraintes de classificateur, les contraintes de transformation et les contraintes de sortie, et à déterminer le classificateur comme robuste aux transformations locales si aucune pareille solution n'existe. L'invention porte également sur un système de perception et sur un support lisible par ordinateur.

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