

Geneva 26-27 September 2018

Source: University of Geneva

Title: Tackling the snakebite humanitarian crisis: First medical decision-support tool for snake identification based on AI and global collaborative expertise

Purpose: Discussion

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Tackling the snakebite
humanitarian crisis:

First medical decision-support tool for snake identification based on AI and global collaborative expertise

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Dr. I. Bolon

Dr. A. Durso

Dr. G. Alcoba

Prof. Marcel Salathé



Source: Jacques Van Niekerk



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citizen
cyberlab



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Source: [Jacques Van Niekerk](#)

A photograph of two women in a rice field. The woman on the left is wearing a white headscarf and a red sari, and is kneeling and working with a bundle of rice seedlings. The woman on the right is wearing a patterned headscarf and a red sari, and is also kneeling and working with a bundle of rice seedlings. The background shows a vast rice field with rows of seedlings and some trees in the distance.

+ 125,000
deaths



+ 400,000
disabilities

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Snakebite envenoming

[Snakebite envenoming](#)[The disease](#)[Epidemiology](#)[Antivenoms](#)[Control and prevention strategies](#)[Treatment and rehabilitation](#)[Information resources](#)

Snakebite envenoming: Member States provide WHO with clear mandate for global action



24 May 2018 | Geneva -- The 71st World Health Assembly adopted a resolution formally providing the World Health Organization (WHO) with a strong mandate to develop a comprehensive plan to support countries in implementing measures for increased access to effective treatment to people who get bitten by venomous snakes. WHO is already working on a strategic plan to assess and address the global burden of snakebite envenoming. The plan is expected to be ready by the end of this year.

[Full story](#)[Read more on the prevalence](#)[Read more on antivenoms](#)[Answers on snakebite FAQ](#)

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WHO has added snakebite to the NTD list: these things need to happen next

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VIEWPOINTS

Participatory approaches and open data on venomous snakes: A neglected opportunity in the global snakebite crisis?

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Vulnerability to snakebite envenoming: a global mapping of hotspots

Joshua Longbottom, MSc   • Freya M Shearer, BSc • Maria Devine, MSc • Gabriel Alcoba, MD •
Francois Chappuis, MD • Daniel J Weiss, PhD • Sarah E Ray, BS • Nicolas Ray, PhD • David A Warrell, FMedSci •
Rafael Ruiz de Castañeda, PhD • David J Williams, PhD • Prof Simon I Hay, FMedSci   • David M Pigott, DPhil •
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Open Access • Published: July 12, 2018 • DOI: [https://doi.org/10.1016/S0140-6736\(18\)31224-8](https://doi.org/10.1016/S0140-6736(18)31224-8) •



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 PlumX Metrics





Innovation needed to urgently tackle this humanitarian crisis in Global Health

Source: [Jacques Van Niekerk](#)

A blue-tinted background image of a lizard, possibly a gecko, perched on a branch. The lizard is facing left, and its body is partially obscured by the text. The background is a solid blue color with the image of the lizard and branch overlaid.

What role for AI?

Source: [Jacques Van Niekerk](#)

What is the biting snake?,
is it venomous?, what type of
venom and what clinical
manifestations to anticipate?

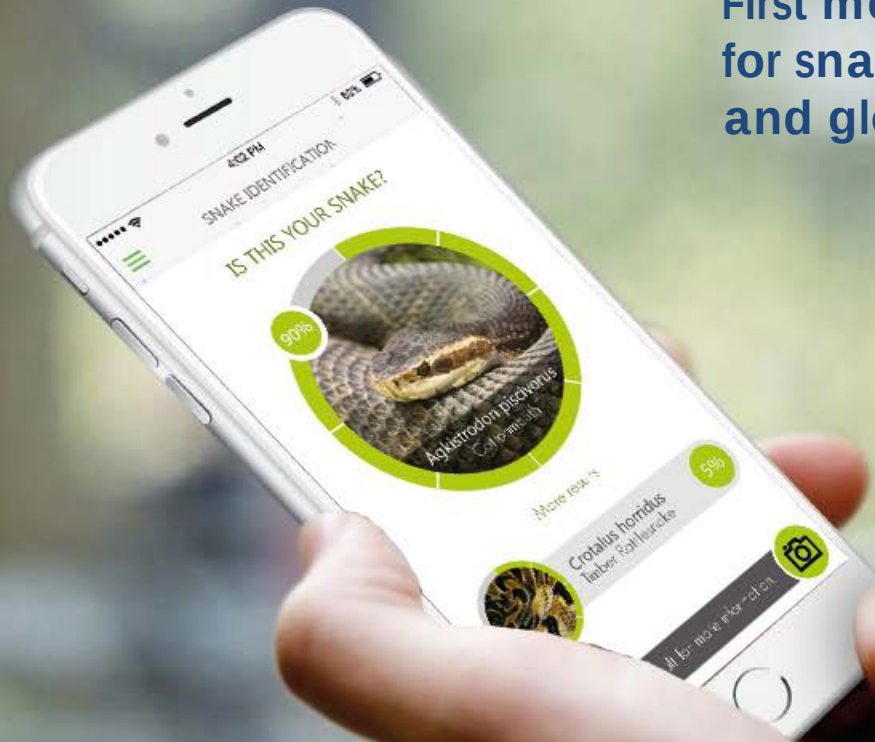
- Snake identification is
key for adequate clinical
management
- Snake identification is
complex and clinicians
are **not** herpetologists



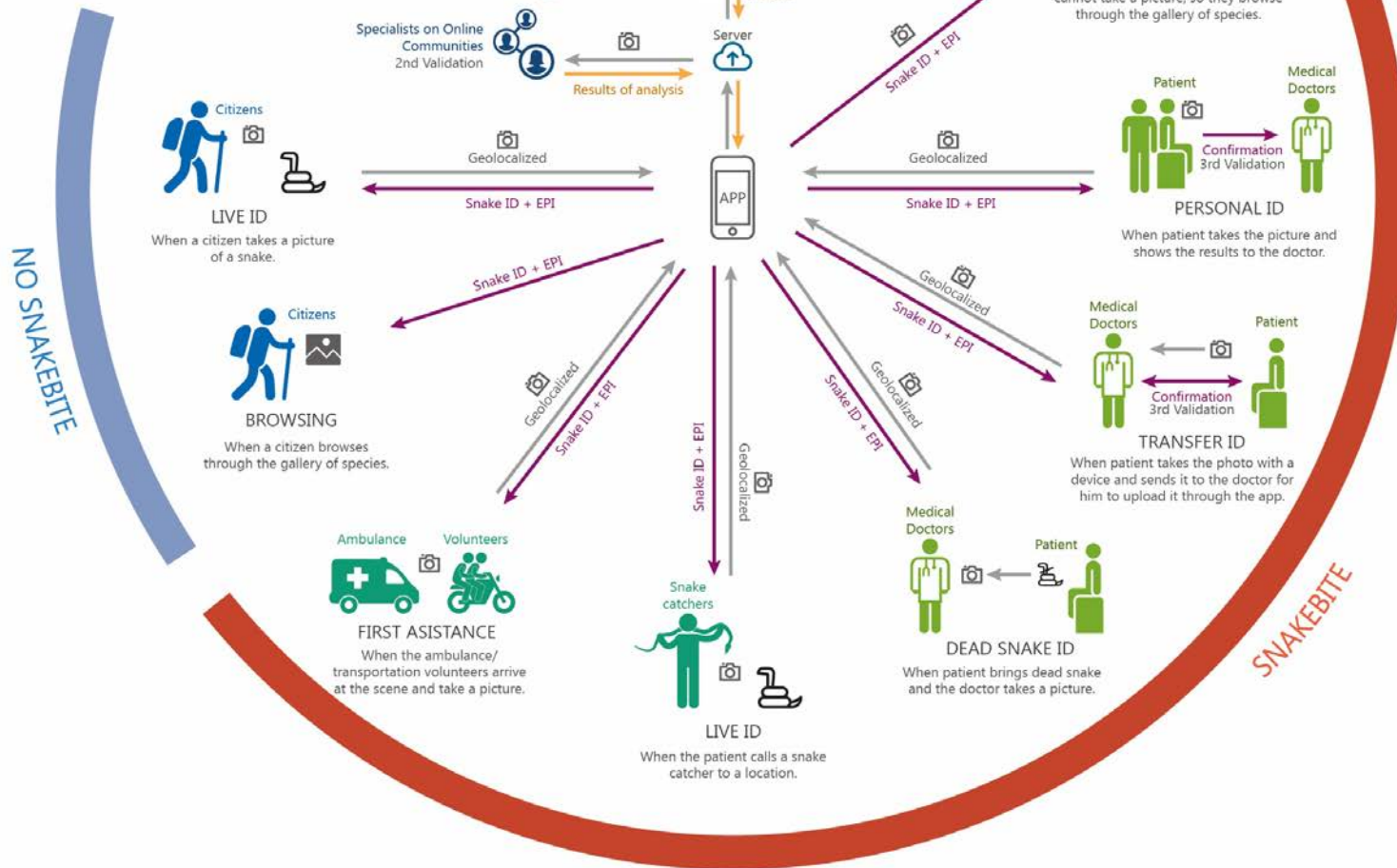
WHO:

“Out of more than 3000 species of snakes in the world, some 600 are venomous and over 200 are considered to be medically important”

First medical decision-support tool
for snake identification based on AI
and global collaborative expertise



SYSTEM DIAGRAM





Source: Andrew Durso



Source: [University of Melbourne](https://www.unimelb.edu.au)

Observations



Snakes



Location

Go

Filters ¹

The World

148,399
OBSERVATIONS



1,717
SPECIES



7,537
IDENTIFIERS



31,195
OBSERVERS

Rank	User	Observations ▾	Species ▾
1	 atrox77	1,499	90
2	 sandboa	1,322	174
3	 mako252	1,295	47
4	 trans-pecos-herpetology	1,286	58
5	 gtsalmon	1,261	89
6	 wild-about-texas	1,249	89
7	 catenatus	1,093	58
8	 toby	1,028	143

iNaturalist



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Brown Vine Snake (*Oxybelis aeneus*)

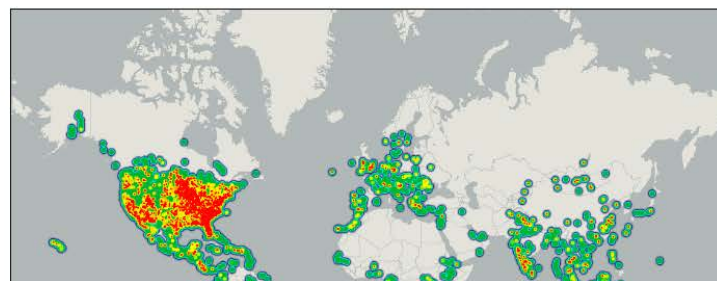


Records Today: 20

Last 7 Days: 710

Last 30 Days: 3,146

Total Records: 235,878





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For snakes & snake people



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**Over 45,000 people die in Rural India
from snake bites every year**



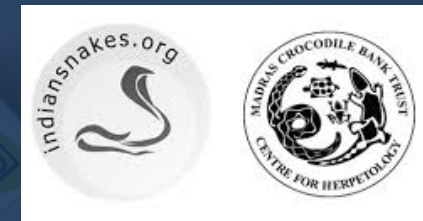
Updates From the Field



India's largest digital snake database



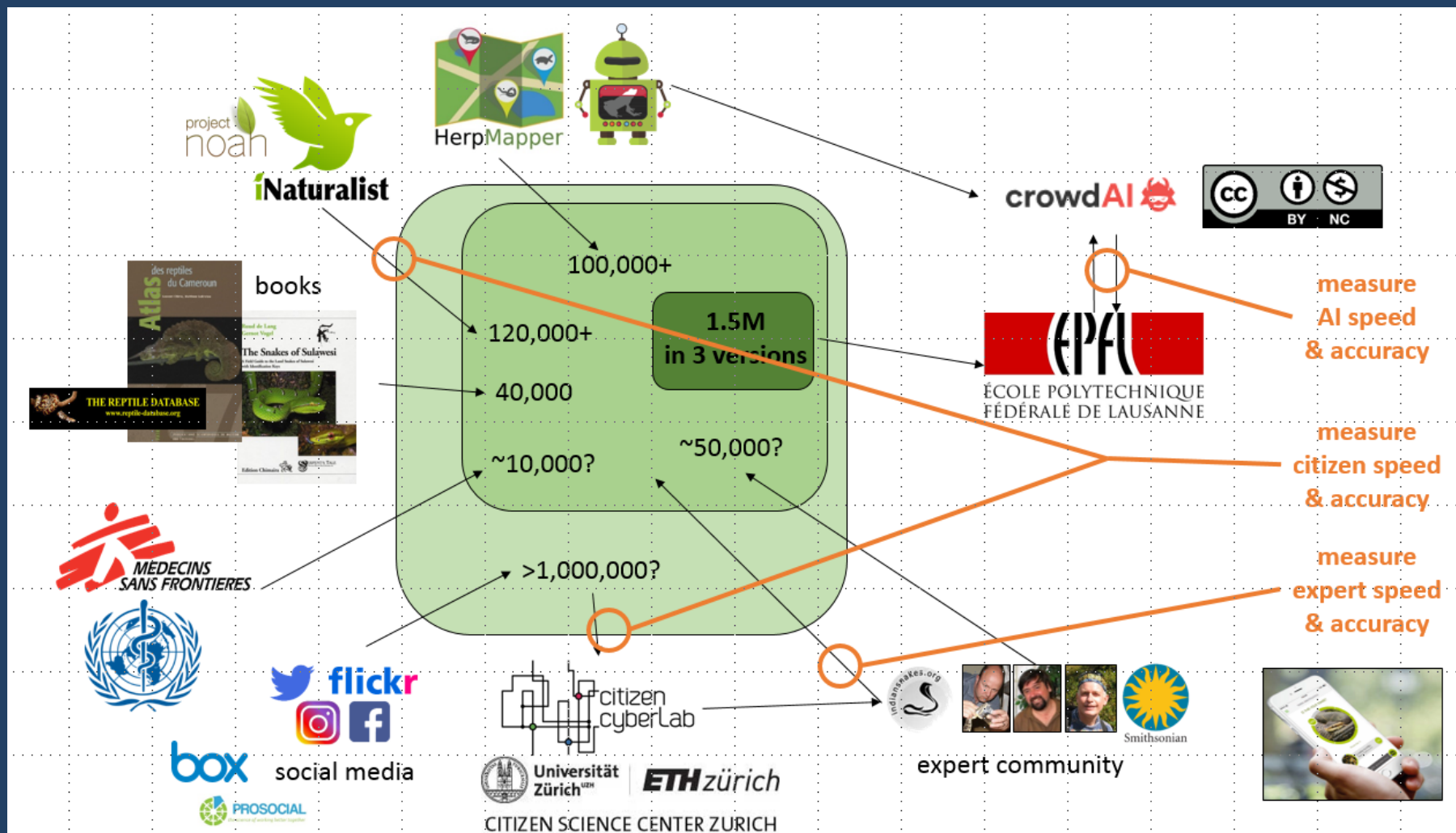
**SEARCH OUR EXTENSIVE
INDIAN SNAKES DATABASE**



Objectives:

1. Build a **massive snake photo repository**
2. Develop and test a system to **identify snakes from photos based on AI**
3. Test the **capacity of online communities of herpetologists** to identify snakes from photos (experts as gold standard)
4. Develop, test and improve an **app** to identify snakes from photos **integrating AI and collaborative expertise**
5. Develop a snakebite management tool/platform: **clinical management, epidemiological monitoring etc.**





Solve real-world problems using open data

crowdAI connects data science experts and enthusiasts with open data to solve specific problems, through challenges.

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