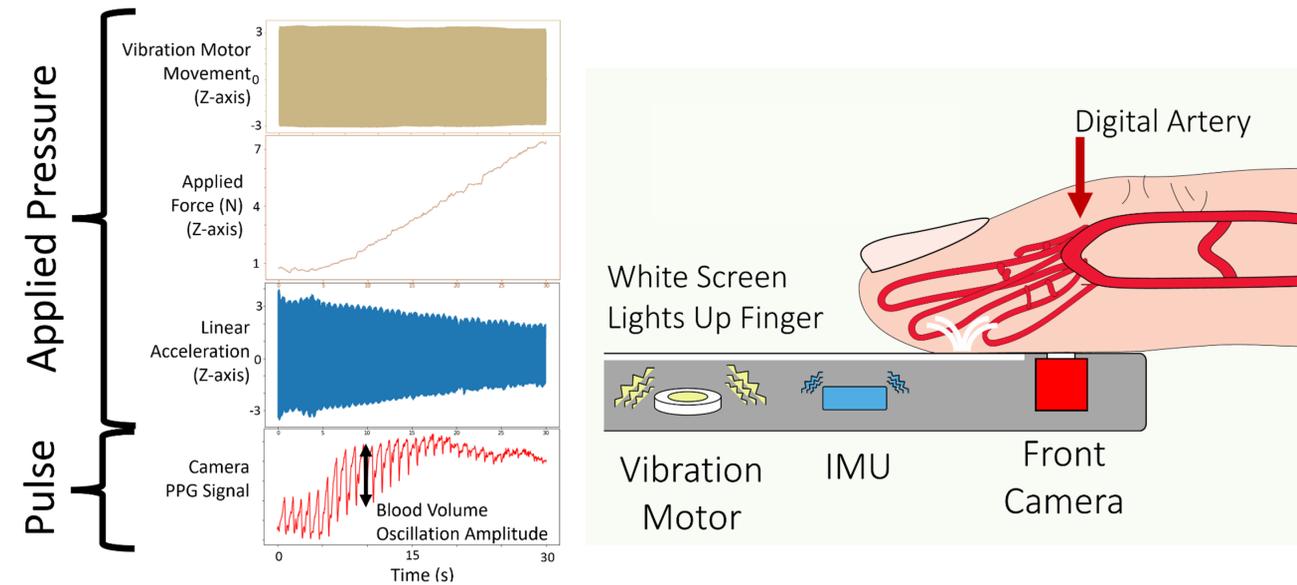


## Concept

Health monitoring is just a download away. The VibroBP app is the first software only solution to measure blood pressure without need for individual user calibration.



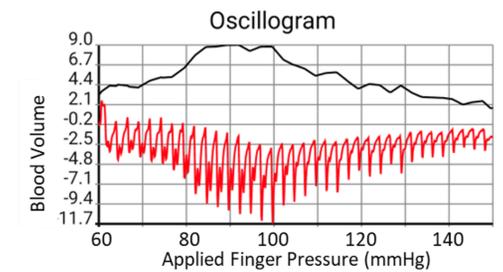
The **VibroBP** measurement leverages the smartphone camera, vibration motor, inertial measurement unit, and display screen included in nearly every smartphone. By leveraging the natural effect of dampening as force is applied to a vibrating object, the app can measure the force applied by the finger as the user presses on the camera. A technique we call Vibrometric Force Estimation.

VibroBP, performs fingertip BP measurements using the same underlying methodology as cuff devices called oscillometry, which requires: **(1) the APPLIED PRESSURE to the artery & (2) the BLOOD VOLUME of the artery.**

## Oscillometric Blood Pressure

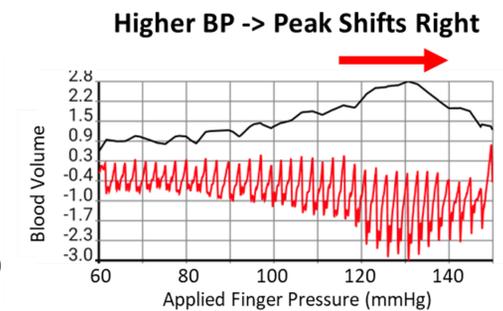
Sys: **116** (mmHg)

Dia: **80** (mmHg)



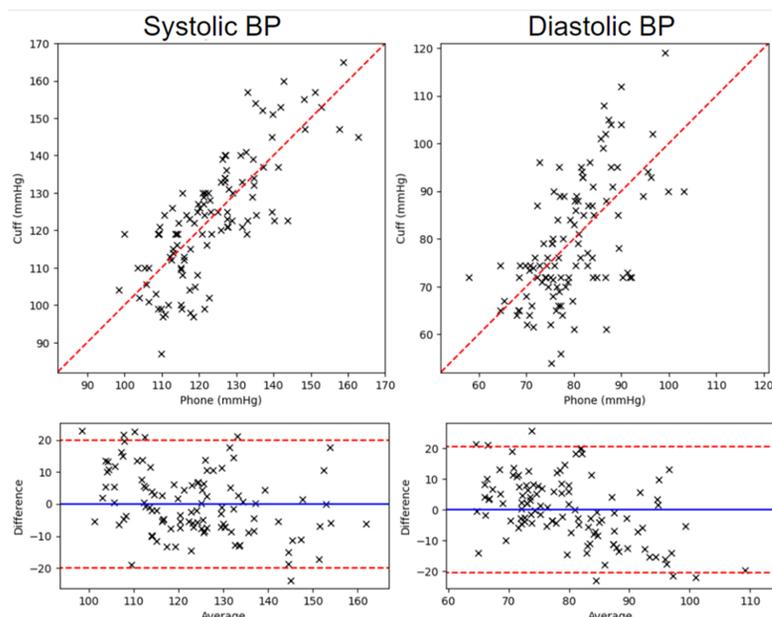
Sys: **141** (mmHg)

Dia: **94** (mmHg)



The applied pressure and blood volume combines into an oscillogram, which captures the pressure required to cut off the pulse. Consequently, for a higher blood pressure, the peak of the oscillogram shifts higher.

## Clinical Feasibility



In clinical study conducted at UCSD (N=24), the VibroBP App has close to FDA required performance of both SBP/DBP with no smartphone modifications or individual calibrations.

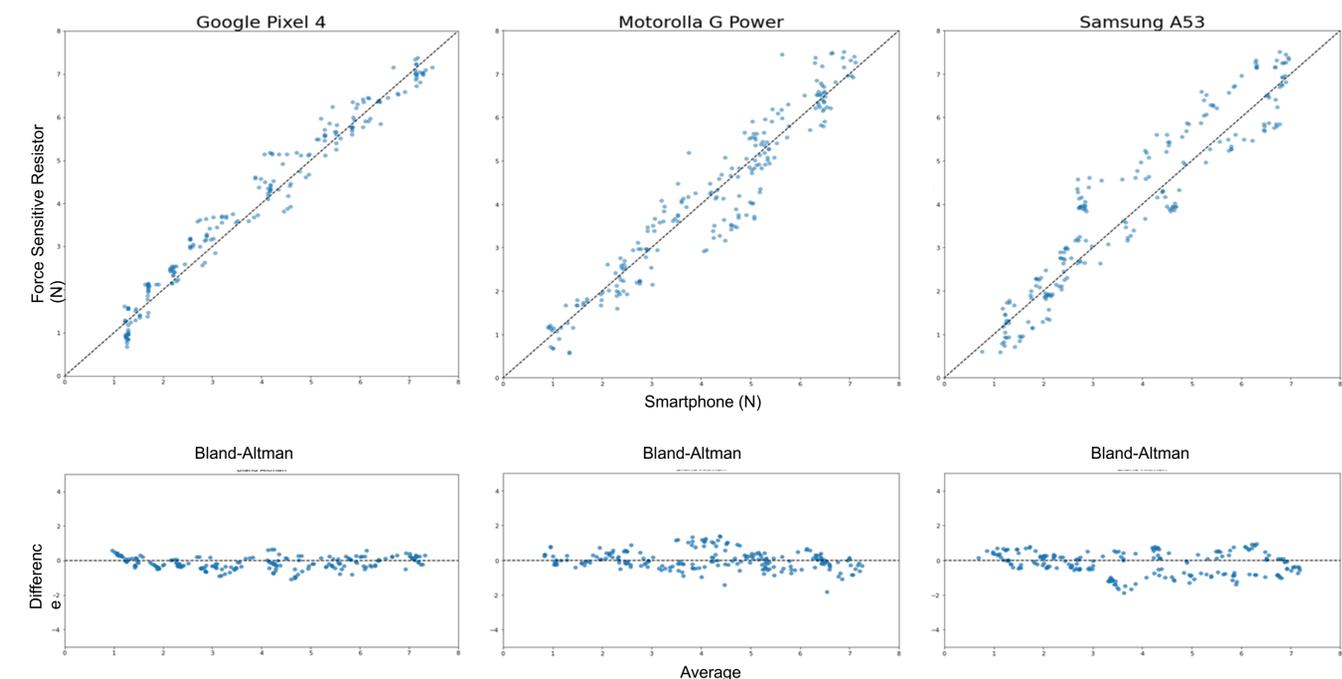
Confusion Matrix

	Normal	Elevated	Type I	Type II
Cuff Readings Normal	0.59	0.39	0.02	0
Cuff Readings Elevated	0.12	0.44	0.32	0.12
Type I	0	0	0.85	0.15
Type II	0	0	0.28	0.72
	Normal <120	Elevated 120-130	Type I 130-140	Type II >140

Smartphone Readings

	Systolic 87-165 mmHg	Diastolic 54-119 mmHg	FDA Target
Mean (mmHg)	0.44	0.03	<5
Std (mmHg)	10.2	10.5	<8

## Technology



The force measure achieved an average correlation coefficient of 0.92 across multiple smartphones of different cost, manufacturer, and physical shape.

## Vibrometric Force Estimation