Given Information about ZNTA's location

First information: Probability of location depending on the distance to river Spree

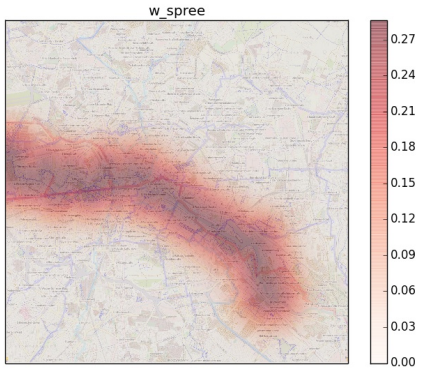
The first information reads as follows:
"The candidate is likely to be close to the river Spree. The probability at any point is given by a Gaussian function of its shortest distance to the river. The function peaks at zero and has 95% of its total integral within +/-2730m."

First, we calculate the distance x_1 of a point (x, y) on the map to the river Spree. This distance is then fed into the following probability density function which we derived from the given information:

$$f_1(x_1) = \frac{1}{\sigma_1\sqrt{2\pi}} \exp\left(-0.5\left(\frac{x_1 - \mu_1}{\sigma_1}\right)^2\right),$$

where $\mu_1 = 0.0$ and $\sigma_1 = 2.730/1.959964 = 1.39288$.

Doing this for each point yields the following map. The darker the red on the map, the more probable it is to find ZNTA at this location, with a maximum of approximately 28%:



Second information: Probability of location depending on the distance to the Brandenburg Gate

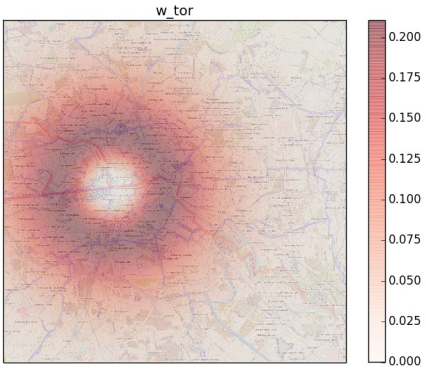
The second information reads:
"A probability distribution centered around the Brandenburg Gate also informs us of the candidate's location. The distributions radial profile is log-normal with a mean of 4700m and a mode of 3877m in every direction."
This yields the following lognormal probability density function for x_2=distance to the Brandenburg Gate:

$$f_2(x_2) = \frac{1}{x_2\sigma_2\sqrt{2\pi}} \exp\left(-\left(\frac{(\ln(x_2) - \mu_2)^2}{2\sigma_2^2}\right)\right).$$

We have

$$\exp\left(\frac{\mu_2 + \sigma_2^2}{2}\right) = 4.7 \text{ and } \exp\left(\mu_2 - \sigma_2^2\right) = 3.877,$$

which yields $\mu_2 = 1.40318$ and $\sigma_2 = 0.53735$.
By calculating the probability for each point, we obtain the following map:



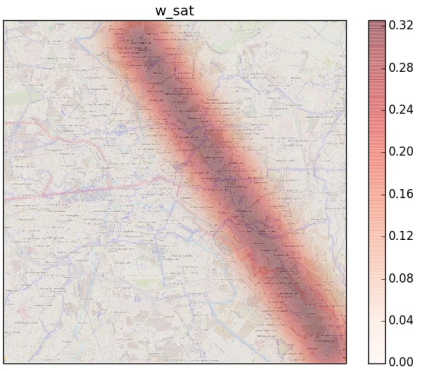
Third information: Probability of location depending on the distance to a satellite's path

Finally, information three reads:
"A satellite offers further information: with 95% probability she is located within 2400m distance of the satellites path (assuming a normal probability distribution)."
That tells us that for x_3=distance to the satellite's path, we have

$$f_3(x_3) = \frac{1}{\sigma_3\sqrt{2\pi}} \exp\left(-0.5\left(\frac{x_3 - \mu_3}{\sigma_3}\right)^2\right),$$

where $\mu_3 = 0.0$ and $\sigma_3 = 2.400/1.959964 = 1.22451$.

This yields the following map:



Result: A map to find ZNTA

Now it remains to calculate the three distances x_1, x_2 and x_3 for each point on the map and pass them to the respective probability density functions. The last step is to multiply the three probabilities and we obtain a map which colors the most probable locations of ZNTA: